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ABSTRACT

This paper traces the development of classification at the Library of Congress in terms of its broader context and by accounting for changes in the present system since its initial period of creation between 1898 and 1910 and the present. Topics covered include: (1) Early Growth of the Collections; (2) Subject Access During the Early Years; (3) A. R. Spofford and the Growth of the Library of Congress; (4) Spofford and Subject Access; (5) From Spofford to John Russell Young; (6) Trends in Classification; (7) A Tentative Beginning, 1897-98; (8) Years of Decision, 1899-1901; (9) Classification Development, 1901-11: General Features; (10) Classification Development, 1901-11: Collocation Patterns; (11) Progress on the Classification: 1901-11; (12) Classification Development: 1912-30; (13) Classification Development: 1930-46--An Interlude; and (14) Classification Development: 1947-Present. A list of annotated references completes the report. (THC)

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The Development of Classification at the Library of Congress

by

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INTRODUCTION

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There is a lack of perspective in all such accounts, however. The Library's classification efforts during the nineteenth century are not discussed in the context of changes that took place in classification concepts. This is particularly the case with the most critical issue in subject access development—the changing definition of a subject and how that changing definition affected subject collocation. More recent developments, especially those that have occurred since 1910, are also not described. In short, the creation of the present Library of Congress Classification has been viewed as such a notable event in its own right that both the larger context of which that creation was a part and the scheme's more recent developments have been neglected. The present essay constitutes an effort to provide additional perspective by tracing the development of classification at the Library of Congress in terms of its broader context and by accounting for changes in the present system since its initial period of creation between 1898 and 1910 and the present.

EARLY GROWTH OF THE COLLECTIONS[2]

The Library of Congress was established in 1800 by the same act that provided for moving the national legislature from Philadelphia to the new city of Washington, D.C. Under the direction of the first two congressional librarians, John Beckley (1802-07) and Patrick Magruder (1807-14)—each of whom also served as clerk of the House of Representatives—the Library grew to some 3000 volumes. This initial collection was destroyed in August 1814 during the British attack on the city.

In 1815 Thomas Jefferson's 6487 volume personal library was purchased by Congress as the basis of a new collection. Jefferson's library marked an important change in the scope of the Library's collection. It differed from the first collection in that it was not limited to historical and legal works but rather reflected Jefferson's "own comprehansive interests in philo-

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SUBJECT ACCESS DURING THE EARLY YEARS

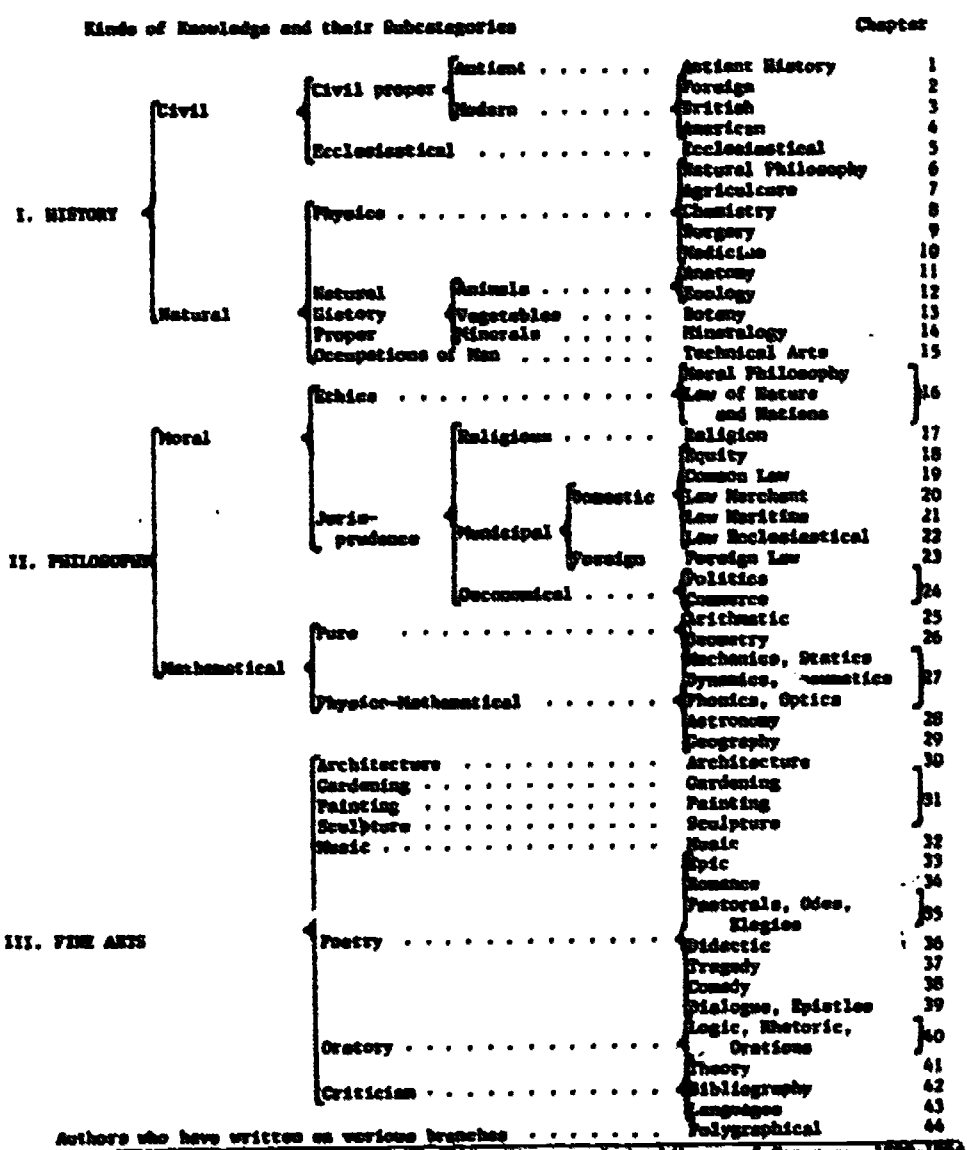
Subject access to the materials of the Library of Congress during its first six decades reflected the Library's limited role and restricted leadership, being generally simplistic and pragmatic in character. Printed catalogs were published sporadically with supplements issued in intervening years. Before 1864, the arrangement of these catalogs followed the order of the books on the shelves. The first three catalogs (1802, 1804 and 1808) and the shelf order they followed were arranged by size: folios, quartos, octavos, and duodecimos, with subarrangement by accession number. Beginning in 1812, both the shelf order and the catalogs were arranged in 18 subject categories. The subject categories were based upon the philosophical classification of knowledge devised by Francis Bacon in his *Advancement of Learning (1605)* but significantly altered, especially through expansion, by Denis Diderot and Jean LeRond D'Alembert in the 1751 publication, "Discours Preliminaire de l'Encyclopedie" which appeared in the first volume of Denis Diderot's *Encyclopedie*.[5]

The Bacon-Diderot/D'Alembert system was more elaborately represented in the classification of books that accompanied the Jefferson library purchase. In Jefferson's system, the books were arranged in 44 "chapters" (i.e., classes) that, following Diderot and D'Alembert and before them, Bacon, reflected the subject divisions and subdivisions of three general types of knowledge: history, philosophy, and fine arts (see fig. 1).

But Jefferson significantly altered the Diderot/D'Alembert scheme, especially by rearranging, displacing, and deleting some of the latter's second and third level subdivisions. One source of the alterations was the sheer difference in philosophical training that informed Jefferson's approach to subject relationships. Another even more important source of the alterations was the difference in purpose that underlay Jefferson's work.[6] Diderot and D'Alembert had been intent on providing a rationalization and discussion of the relationships of the various branches of thought dealt with in Diderot's *Encyclopedie*. The result was something of an intellectual map of the universe of knowledge, ideally complete with respect to the elements or classes of knowledge it encompassed, thoroughly systematic or logical in terms of how those elements or classes were related given Diderot's and D'Alembert's fundamental philosophical presuppositions, and useful as an overview of how all the various individual topics dealt with in the encyclopedia fell together into a grand scheme.

Jefferson began with the far different purpose of making an arrangement of books that would enable him to acquire additions to their numbers and

Figure 1



Taken from facsimile reproduction in Johnston, History of the Library of Congress, 1800-1864.

Fig. 1. Jefferson's Classification

retrieve them easily. His portrayal of the universe of knowledge was limited, therefore, by three important practical considerations. Its completeness was affected by the range and depth of the elements of the universe of knowledge that were actually present in his book collection. It had to include provisions for the way books as physical objects presented those elements of the universe of knowlege—for example, whether books treated multiple topics. And it was shaped by what Jefferson found personally convenient and satisfying with respect to the collocation of the classes into which his books fell.

One striking result of the practical considerations was Jefferson's creation of a special class (chapter 44) for polytopical works, a category that had no counterpart in a philosophical scheme but that was needed in a book classification. Another was his treatment of theology (chapter 17). Jefferson separated it from ecclesiastical history (chapter 5) and subordinated it to the larger category of jurisprudence most likely because he had relatively few theological works and viewed them chiefly in terms of their bearing on civil polity.

Book classification, limited by these practical considerations, became a normal part of subject access procedures for the librarians of Congress during the succeeding decades. Watterston and Meehan took similar liberties with the basic nomenclature of the system that they had received from Jefferson now and again rearranging, discontinuing or adding main classes and subclasses.[7]

It should not be surprising that a generally pragmatic approach to classification characterized shelf arrangement at the Library of Congress during this period. Prior to the Civil War, libraries in the United States were in a primitive state and librarianship was often little more than a gentleman-scholar's polite occupation. There was almost no extant literature to which librarians could turn to for help in library matters even had they wanted to do more than passively oversee their collections. Some persons took pains to arrive at systematic subject arrangements of books, but they were relatively few in number. Most librarians had neither the time nor the inclination to pursue classification rigorously.[8]

Book classification was also in a primitive condition. One sign of that condition was a general dependence on class entry as the principal method of subject specification and the lack of precision that this method entailed. Instead of entering books under terms that matched the particular topics that books treated, books were placed in large and undifferentiated classes that were broader than those particular topics. The effect of this practice

was to obscure the particular topics of books and, where book collections were large, to make retrieval of books difficult or, at times, even impossible.

One reason for a class entry approach to subject specification was that most book collections were simply too small to need book classification structures of greater sophistication. Retrieval of works on particular topics could easily be augmented by scanning the titles of books placed in broad subject divisions.[9] Even the larger libraries of that day tended to adopt class entry. The constraints of natural lighting and alcove arrangement when combined with a traditional dependence on fixed location book numbers, made it inconvenient to use more than simple arrays of large general subject categories for the shelf arrangement of books. Where classed catalogs were also produced, these too tended to depend on broad class arrangements.[10]

Another reason why classed entry was followed in book classification was the limits imposed by classification thinking. Book classification, being still little more than a practical extension of the more general attempt by philosophers to classify all knowledge, had not gone beyond the chief method of the philosophers for devising subclasses—subdivisions based on logical definition. In other words, subcategories of any general subject were defined primarily in an Aristotelian *genus et differentiam* manner: the relationship of any one subordinate subject to its superordinate class dependent largely on the intrinsic relationships of the terms involved.[11] A definitional approach to class subdivision limited the ability of shelf classifiers to subdivide a classificatory structure so as to accommodate the particular subjects treated in particular books, especially those that bore only "extrinsic" relationships to broader classes.[12] This was a critical limitation. The first half of the nineteenth century witnessed a growing number of publications that had topical contents named only by joining extrinsically related terms. With no easy method to place such topics in a classification scheme, classifiers simply entered such books in broader classes.[13]

A final reason classed entry was followed in book classification had to do with the very idea of a subject itself. The current assumption that a book or a document *has* a subject, where the notion of subject bears the same relationship to the book or document that the idea of a personality bears to a human being, was not considered at that time. Instead, the idea of a subject in this earlier period was much more formal and restricted in meaning. The word itself appears to have been borrowed from more formal attempts to classify all knowledge. It functioned as a technical term that indicated only those topics of thought that had become more formally

established as logical elements of a classificatory structure of knowledge.

Defining subjects this way made the goal of subject access narrower than that of subject systems today. Classifiers did not display books and documents under names or symbols representing their entire topical contents but rather only under those established topics of which, in the narrower sense of the idea of a subject, the books or documents gave evidence. One should not conclude, however, that classifiers had simply chosen a lesser goal for subject access. Such was the hold of the more restricted idea of a subject that the modern idea of indicating the subjects of books was simply not thought of as a goal.[14]

The foregoing characteristics of mid-nineteenth century subject classification made the activity of book classification a widely variable, limited and even confusing activity. It is unlikely that many librarians at that time were troubled over the matter, however. As already noted, most libraries were so small that book classification, even in its primitive state, worked tolerably well. It was only when library collections began to grow markedly after mid-century (a few collections containing tens of thousands of volumes) and only as a new breed of librarians appeared on the scene who were concerned about the inadequacies of the older methods of subject access, that new methods were sought.[15]

A.R. SPOFFORD AND THE GROWTH OF THE LIBRARY OF CONGRESS

The Library of Congress began to face difficulties related to rapid collection growth during the 1860s. The major part of this was due to the work of Ainsworth Rand Spofford, who exercised his influence for more than 40 years (1861-1908). Spofford's consuming interest in the acquisition of books was an illustration of the new breed of librarian during this period. He believed strongly that reading and libraries bore a positive influence on the development of both individual and national character. He also believed that a national comprehensive collection should be available not only for Congress but also for the general public. In the words of John Y. Cole, Spofford's biographer:

> A comprehensive collection covering all subjects was therefore as important to Congress as it was to scholars and the general public. Once this collection was developed for the use of the national legislature, it should be made available to the rest of the American people, for the strength of the Republic itself depended upon "the popular intelligence."[16]

As a result of Spofford's leadership, the Library underwent prodigious growth so that by 1897 its book collection alone had increased to more than 800,000 items. Beginning in 1872, Spofford also lobbied for the construction of a new building to accommodate the growing collection, but a building was not completed until 1897.

SPOFFORD AND SUBJECT ACCESS

Another way that Spofford may be identified with a new breed of librarians after mid-century was his effort to improve subject access to the collections. In 1864 under his direction as assistant librarian, the Library issued its first catalog arranged alphabetically by author. This catalog was significant because it was the first break from the Library's long tradition of systematically classed catalogs that followed the Library's shelf order. It also expressed Spofford's strong belief in the utility of alphabetical arrangement. By 1869 he extended his belief in alphabetical order with the publication of a two-volume alphabetico-classed subject index to the Library's collection. In that format subjects were arranged alphabetically rather than systematically at each hierarchical level. Those in the main listing formed one alphabetical sequence. Subclasses formed separate alphabetical sequences under their respective main headings. And subsubclasses formed still other alphabetical sequences under their respective subclasses.[17]

Spofford's willingness to alter the systematic structure of the classed catalog was both an implicit criticism of the traditional format of the latter and an attempt to escape the class entry impasse that such cataloging had reached. But neither his attitude toward systematic classification nor his concomitant acceptance of the efficacy of alphabetical order were unique. His faith in the latter reflected an interest in a method of bibliographic organization that became dominant between the late 1840s and the mid-1870s with the rise in popularity of the dictionary catalog. And his use of alphabetical sequencing to create an alphabetico-classed catalog was itself part of a brief but energetic period of experimentation with that format between the 1860s and 1880s.[18]

The ostensible theme of those experiments was to reconcile the supposed simplicity and, therefore, practicality of alphabetical order found in dictionary catalogs with the systematic order of classed catalogs. The most visible result was the use of sequencing of the kind described above. More important than this result was the influence on alphabetico-classed cataloging of the dictionary catalog's approach to subject specification.

Prior to the 1870s, dictionary catalogs provided subject access to books by entering the books under the most significant words of their titles. This was important because it ensured that the subject analysis process focused directly on the particular subjects that books treated and that books could be accessed in terms of those subjects. Focusing on the particular subjects that books treated and always making the books accessible by means of those subjects was strikingly different than typical classed catalog procedure where the starting point in subject analysis was the identification of the largest class in the system which included the particular subject of a book and where the entry of the book often stopped short of the particular entry itself. The latter resulted in class entry or subentry rather than specific entry or subentry.

Dictionary catalog procedure had shortcomings, of course, particularly where dependence on title/subject words led to a faulty indication of what subject or subjects a book treated and where there was little attempt to control synonyms. But its focus on the particular subjects in books was unique in the history of subject access and represented an effort to meet the challenge of providing precision in subject access in a way that had not been achieved previously. In contrast, systematic classed cataloging had not been able to meet that challenge because its class subdivision procedure, based on logical differentiation, could not easily determine the precise classificatory positions of the particular subjects that books treated. As a result, class structure was rarely extended hierarchically to the level of those particular subjects and books tended to become buried in categories that were broader than the topics the books treated.

Alphabetico-classed structure overcame one aspect of that difficulty by removing the need for precise positioning within classificatory arrays.[19] A cataloger only needed to determine the level at which a subject should be subordinated—in other words, its position in a hierachical chain—rather than both the level and its position within the array at that level. The reason for this was that positioning within the array was itself relegated to alphabetical rather than some logical order. For example, given a work on oak trees, one need only determine a superordinate chain such as BOTANY-TREES-OAK, rather than also finding out the sequential place of oak among an array of various kinds of trees such as pine, sycamore and walnut. As a result of the loosening of the requirements for precise positioning, alphabetico-classed cataloging procedure could produce catalogs and indexes of greater downward extension toward narrower subjects. That in turn raised the possibility of an entry process that reached ever closer to the particular subjects treated by books. In fact, one of the most striking features of alphabetico-classed catalogs and indexes was

their more complex classificatory structures.

Despite the improvement that alphabetico-classed cataloging represented in accommodating the particular subjects of books, it also represented a serious failure. The same process that enabled a subject cataloger to produce extended classified chains also allowed him to forego some of the rigorous work of logic that classification required. This denial of classificatory logic occurred not only within arrays where systematic sequencing was replaced by alphabetical order but also in the alternative of direct entry that the system provided. Direct entry occurred when a classifier encountered a subject for which even its hierarchical level was not certain, either because there was little indication of what constituted its including class or because it could be placed logically in more than one hierarchical chain. In those situations, the classifier had the option of placing the topic in the main alphabetical sequence of subjects without any effort to determine its hierarchical level. That alternative amounted to the direct and specific entry found in dictionary catalogs and to follow it even some of the time resulted in a catalog with a mixed approach to subject access. Some books were entered in the catalog on the basis of classification, others on the basis of the absence of classification.[20]

Ultimately, therefore, while alphabetico-classed procedure facilitated classification, it also subverted classification by taking away its precision and, in cases involving the use of direct specific entry, its necessity. Such disadvantages did not outweigh its usefulness as a solution to providing high quality subject access, however. Its proponents were able to continue their identification with classification as fundamental for subject access. More important, in contrast to systematic classification which was rigid in structure but clouded with difficulties, they gained a classification procedure that was relatively loose in structure and workable. It was workable because it required a significant amount of pragmatism, particularly in the need to make decisions about when to subordinate subjects and when to enter them directly.

Alphabetico-classed cataloging with its pragmatic overtones and its use of alphabetic order was especially important in Spofford's subject access work. He not only used an alphabetico-classed format in his 1869 catalog, but exercised its direct entry option to an extraordinary degree by breaking up many larger general classes in order to place their major subdivisions in the main alphabetical sequence of topics. He also directly entered works on the history and other aspects of particular places under place names in the main alphabetical sequence. This contrasted sharply with the traditional classed catalog procedure of subordinating works on places to general

subjects.[21]

Spofford approached the expansion and restructuring of the Library's shelf classification system in a similar pragmatic way and with the same dependence on alphabetical order.[22] He retained the general outline of the Jeffersonian system but continued the practice of making important rearrangements of the main classes or chapters. By 1897 the basic classes consisted of ten groups. Because the collections were expanding rapidly, he found it necessary to subarrange the basic classes well beyond that which previous librarians had done. His strong opposition to systematic subdivision led him to devise a running list of simple subdivisions, collocated, more often than not, in an alphabetical way or on the basis of general similarity, under the assumption that they were likely to be searched for together. As simple as this procedure might sound, it ultimately produced approximately 10,000 subdivisions.[23]

Spofford's development of a notation for the shelf system further underscored his pragmatism. He numbered the subclasses he had devised not by extending the basic chapter numbers but by beginning a second series of sequential numbers to indicate the subclasses themselves. The source of this numbering system was the physical shelf number in the Library, and his use of this device had the effect of turning the notation into an absolute location system in which a subclass was identified with a particular shelf or series of shelves. The notation subsequently appeared as a fraction: for example, 2/2012 indicated chapter 2 (FOREIGN HISTORY, in part), subclass 2012, located on the shelf of that number. Books within a subclass (i.e., on shelf 2012) were then subarranged alphabetically by author in contrast to the former practice of numbering them sequentially as acquired. Sometimes, of course, the books of a subclass could not all be contained on a single shelf. Therefore, he occasionally arranged such sections over a series of shelves, and the series of shelves became the subclass.

In time this system proved to be awkward because it limited a subclass to the shelf or shelves allocated in the initial distribution of the books. When the books in a class eventually increased in number and overflowed their designated shelves, Spofford severed the shelf number from the idea of a physical location and assigned extra shelving as overflow locations for the subclass numbers. This practice served in the end to make the system into a curious blend of relative and absolute location devices.[24] A more serious problem arose because of Spofford's lack of precise subject subdivisions. As the collection grew in size, an increasing number of dissimilar topics were gathered together in various subclasses. For example, the section for books

on CANALS (chapter 15, shelves 9453-9456) might at first glance seem to have been arranged in a practical manner in which general works (books on CANAL AND RIVER IMPROVEMENTS in general, assigned to the location 15/9453) preceded specific ones (books on the PANAMA CANAL, assigned to the location 15/9456). But the whole range of subtopics included in sections 15/9453 to 15/9456 (see fig. 2) indicates that a disturbing number of incongruities in subject collocation had actually occurred by interpolating such distantly related topics as "sanitary engineering," "plumbing," "pumps," "artesion wells," "waterworks," and "street cleaning" between the two canal topics just noted.

Chapter Name	*Chapter Number*	*Subclass Number*	*Topics Included in Subclass*
Technology	15	9453	Canal and River Improvements Inland Navigation Sanitary Engineering Plumbing Pumps
		9454	Artesian Wells Waterworks
		9455	Street Cleaning River Improvements
		9456	River Improvements (Cont'd) Mississippi Improvements Inter-ocean canals Panama Canal Suez Canal

Taken from Scott, "J.C.M. Hanson and His contribution to Twentieth-Century Cataloging," p. 169.

Fig. 2. Examples of Subclass Incongruities in Spofford's System

Spofford freely admitted that his approach to subject collocation had made both the 1869 printed subject catalog and the shelf classification scheme into "subjective" systems. But he claimed that the subjective nature of the shelf system did not matter as long as the speedy retrieval of items was accomplished. The latter was possible because both he and his "intelligent assistants" were so familiar with the idiosyncrasies of the system that they simply knew where things were. He could conclude, therefore: "That is my system. It may be right or it may be wrong but it is there and we produce the books much more quickly than they could be produced by any other method."[25]

One important reason why Spofford resisted making a more systematic shelf classification scheme during his tenure as the principal librarian, besides the obvious problem of limited staff and time, was that his concept of a national library did not include the matter. In particular, Spofford did not hold the opinion that a national library, besides being a comprehensive collection, was also to be the center of a national network of libraries with respect to such technical matters as cataloging and classification. In his opinion, methods used to organize and give access to the materials of the collection were of concern only to the internal administration of the Library. For this reason, Spofford felt it necessary simply to extend the methods and devices already in existence rather than to radically alter them. Spofford's attempts to improve the system he inherited were notable. And his insistence on such practical measures as the use of alphabetical arrangement and the utilitarian collocation of subjects became essential components of the Library's approach to subject access.

FROM SPOFFORD TO JOHN RUSSELL YOUNG[26]

As a new library building neared completion in the mid-1890s, questions were raised concerning the administration of the Library including its backlog in cataloging and the utility of its shelf classification system for the new facility. The Library had grown at such an enormous rate that Spofford and his small staff could not keep up with all that needed to be done. When the collection was eventually transferred to the new building between August and October 1897, nearly 240,000 books, 175,000 pamphlets, and a large quantity of newspapers, periodicals, and foreign government publications out of a total of over 1 million items transferred remained uncataloged and unclassified.

Congressional hearings were held by the Joint Committee on the Library late in 1896 to evaluate the condition of the Library and to recommend a new organization. The most important result of the hearings was their effect in extending the purpose of the Library. The Committee accepted testimony from prominent American Library Association members among whom were Melvil Dewey and Herbert Putnam. These witnesses emphasized that the Library of Congress should not only be a comprehensive collection but that it should also be the center of a national library network, offering practical as well as inspirational leadership. To reach these objectives it should develop classification and cataloging systems freed from the limitations of one man's personal knowledge of the

Library and expressive instead of the most recent developments within the profession. This emphasis had a profound effect on the development of a new classification system.

In January 1897, John Russell Young was appointed librarian to succeed Spofford, who became chief assistant. Young made several important moves during his brief tenure (1897-99) that affected the direction classification would take. In September 1897 he hired James Christian Meinich Hanson as the chief of the newly created Catalog Division. And in December of that year Charles Martel became Hanson's chief assistant for classification. Both men had considerable experience with contemporary classification developments and together they made one of the most impressive classification teams ever assembled. Young ordered them to study the possibilities of developing a new classification scheme. His outlook suggests that he wanted to ensure the creation of a unified and comprehensive scheme that would be commensurate with the universality of the Library of Congress' existing collections and that would express the newer developments in classification that were taking place within the profession as a whole.

TRENDS IN CLASSIFICATION[27]

Modern classification practice could be said to have begun in 1876 with Melvil Dewey's use of relative location in his Amherst classification even though his scheme did not take on its modern form and proportions until its second edition in 1885. By the time a sixth edition had been published in 1899, however, the *Dewey Decimal Classification* had become by far the best known and most popular book classification system in existence. Other classifiers followed Dewey's lead and inspiration and became active during the same period. Chief among these was Charles Ammi Cutter. Cutter had begun his labors in classification in the alphabetico-classed tradition at Harvard College during the 1860s. After an interlude (1869-76) in which he developed the prototype of the modern dictionary catalog system, he turned to systematic enumerative classification in 1878. His first effort in classification was a system devised between 1878 and 1886 specifically for the Boston Athenaeum. Beginning in 1886 he modified that system into his better-known general scheme, the *Expansive Classification*. By 1893 it consisted of six separate but related schedules (expansions) for libraries of increasing size. During the middle 1890s Cutter began the seventh and final expansion of the scheme designed for the very largest libraries. After 1895 he developed its schedules in the order of the particular needs of the Newberry Library in Chicago.[28]

Dewey, Cutter and others met the nineteenth-century crisis in book classification by grappling directly with its most fundamental problem, the difficulty of dealing with a growing and increasingly complex welter of subject relationships. They did so by investing enormous amounts of time and labor in the sheer enumeration of subjects and in experimenting with how those subjects might be logically and even scientifically ordered. The discipline they brought to subject enumeration changed the character of subject classification development in several distinct ways.

Efforts to enumerate subjects greatly aided a transition that overtook subject access work by the end of the century in how the idea of a subject was viewed.[29] Subject access workers before the 1860s had typically identified subjects first of all as elements of the classificatory mapping of established subjects and only secondarily as the topical contents of books. In other words, there was no automatic equation between the topical contents of books and the validity of subjects per se. This general view of subjects was obviously limited in scope in comparison with the modern equation of subjects with the topical contents of books without any other qualifications. It also severely limited the goal of a subject access system by giving access only to that narrow range of topics of thought validated as subjects in the restrictive sense of the term rather than to the entire topical content of each book in turn.

Book classification system makers like Dewey and Cutter were indebted to that earlier approach to subject access insofar as they began their subject analysis process with an ideal classificatory structure of subjects in mind. This earlier framework influenced their decisions about which subjects treated in books were to be given access and also how the structural relationships of those subjects should be displayed in a classification scheme. But they also differed from earlier subject access thinking in that they allowed books themselves and their entire topical contents to influence the final structures of their systems. In other words, following those who had developed alphabetical approaches to subject access, they emphasized making books the starting point and focus in a significant portion of the subject analysis process. And this in turn had the effect of identifying subjects with books themselves (especially in the case of new books) rather than with a prior sense of a scheme of valid subjects that filtered the way one viewed the relationship of subjects to those books. The result was to begin a process that several decades later would change the goal of subject access from simply giving access to those subjects treated in books that were considered established, to giving access to the entire topical contents of documents.

Enumerative classification also helped to establish the idea that subjects could not be restricted to relationships based purely on subject definition. Classifiers began from the latter basis more often than not, but soon were experimenting with a variety of other sequencing and subdivision techniques. These included such things as the standardized treatment of form and aspects of subjects, the division of subjects by places and periods, and the sequencing of subjects in arrays by such alternative methods as evolutionary order or the order in which topics had appeared in history. Ultimately, experimentation of this kind led some to subject order based on an assessment of its direct utility to users as they searched for books regardless of how that met the requirements of strict systematization.

Enumerative classification not only established the utility of notations in classification but also the prejudice that a notation should, if possible, be relatively simple to understand, brief and mnemonic. Unfortunately, this approach to notation also led to a fundamental conflict with other desirable characteristics such as a notation's hospitality to new subjects and its expressiveness of the relationships in the subject enumeration. In fact, such was the importance ascribed to a relatively simple and brief notation during this period that excessive consideration of it often limited or skewed the logical or scientific order of the scheme itself. Last, enumerative classification established that a comprehensive classification system could not be developed or promoted by a single person working in isolation and still remain viable as a widely adopted subject access tool. Both Dewey and Cutter enlisted the aid of specialists and developed their schemes in reference to major library collections. Dewey went one step further by establishing an organizational structure to provide for the upkeep of his scheme.

The foregoing measures were not explained systematically during the time that they were established and may seem clear now only in retrospect. Nevertheless they deeply affected the nature of contemporary book classification work by setting a pattern for its further development. The measures were especially important for the Library of Congress because they provided the context that shaped the development of its own modern shelf classification system.

A TENTATIVE BEGINNING, 1897-98

Hanson and Martel had several alternatives open to them when they began their study in December 1897, but the result of their initial work was to

demonstrate to John Russell Young, who was unfamiliar with the technical problems of classification, that the old system needed to be replaced. They demonstrated that existing general classification schemes such as Dewey's and Cutter's would also need extensive alterations to make them amenable to the needs of the Library of Congress. Thus they began in 1898 to outline the requirements for a new system. For this purpose they determined to borrow the best features of existing systems so that a new scheme would have a solid basis but still be particularly suited to the special requirements of the Library. They decided to avoid complex and hierarchically expressive notations of the kind used in Cutter's and Dewey's systems not only because they themselves had reservations about such notations but in order to placate the strong antipathy toward such notations (especially the decimal system) held by Spofford who, under Young, served as a principal consultant.

Thus, a notation was at first devised that consisted of single letters and the integers 1 to 9999 for each separate general class. In their search for a subject arrangement, three extant schemes were examined for their usefulness. Otto Hartwig's *Halle Schema* was rejected as too strongly oriented to German philosophical thought and academic libraries. Dewey's *Decimal Classification* was rejected because of what they considered its deficiencies in the basic arrangement of subjects. In Martel's words, it was a "system... bound up in and made to fit the notation, [and] not the notation to fit the classification."[30] In contrast, they found Cutter's *Expansive Classification* more acceptable and eventually borrowed heavily from it.

The choice of Cutter's scheme as a base upon which to build is not strange since both men had become familiar with it in previous library work—Martel at the Newberry Library in Chicago and Hanson at the University of Wisconsin. Their decision might well have been reinforced by the reputation it had gained as the most carefully devised and scholarly American system then available. Because the seventh expansion of Cutter's system was unfinished at this time, however, and would remain unfinished after Cutter's untimely death in 1903, it was never able to be used as any more than a partial base.

Having decided to proceed with a new scheme, Hanson made a tentative distribution of main classes in the new notation. His dependence on Cutter's *Expansive Classification* for the general order of the new scheme is evident. The chief difference consisted of bringing recreation, music, fine arts, literature, and language forward from their position in Cutter's scheme to precede the sciences and technology (see fig. 3).

Figure 3

Expansive Classification		First LCC Outline, 1899	
A	General Works	A 1-200	General Works
B-BQ	Philosophy	A 201-3000	Philosophy
BR-BZ	Religion	A 3001-89999	Religion, Theology, Church History
C	Christianity & Judaism	C	Biography & Studies auxiliary to History
D	Ecclesiastical History	D	General History, Local History (except America)
E	Biography	E-F	America, history and geography
F	History & Studies auxiliary to history		
G	Geography & Travels	G	Geography & allied studies, Anthropology & Ethnology
H	Social Sciences, Statistics, Economics, Political Economy	H 1-3000	Political Science
		H 3001-9999	Law
I	Demotics, Sociology, Education	I 1-8000	Sociology
		I 8001-9999	Women, Societies, Clubs, etc.
J	Civics, Political Science	J 1-2000	Sports, Amusements
		J 2001-9999	Music
K	Legislation & Law, Societies, Clubs	K	Fine Arts
L	Science & Arts, Physics, Chemistry	L-M	Philology & Literature
M	Natural History, Geology, Paleontology, Biology		
N	Botany	N	Science, Mathematics, Astronomy, Physics, Chemistry
O-P	Zoology, Anthropology, Ethnology	O	Natural History, Geology
		P	Zoology, Botany
Q	Medicine	Q	Medicine
R	Useful arts, Agriculture, Technology	R	Useful arts, Agriculture
S	Constructive arts (Engineering & Building)	S	Manufactures
T	Fabricative arts, Manufactures, Handicrafts	T	Engineering
U	Art of War	U	Military, Naval Science, etc.
V	Athletic & Recreative Arts, Theatre, Music	V-Y	Special Collections
W	Art, Fine Arts		
X	Language		
Y	Literature		
Z	Book Arts		

Cutter's outline is from his Expansive Classification, Part 1: The First Six Classifications (Boston: 1891-93); the first LCC outline from LaMontagne, American Library Classification, pp. 228-29.

Fig. 3. Cutter's *Expansive Classification* & The First *Library of Congress* Classification Outline

The first schedule developed was class Z. This schedule was chosen in order to reclassify the bibliographies in the old system—a task of primary importance. The decision to begin with the Z schedule also decisively affected its format because it became the only class for which a section of the Cutter classification was adopted almost without significant alteration in the

general order of its subject categories. The structure of the Z schedule also became a bell-wether of developments to come because it demonstrated the commitment that Hanson and Martel had to relatively simple collocation patterns. The most notable of these was the use of alphabetical order for the sequencing of subjects when a logical order was either not apparent or would involve more time and effort than was available. Their strong dependence on alphabetical order may also have been a result of the continuing influence of Spofford. This appears to be the case especially in the section of subject bibliographies where the sequence of topics was not simply alphabetical, but alphabetico-classed. Other arrangement patterns regularly used were geographical and chronological order and the first attempts at the use of a general pattern of order within classes that later would become known as "Martel's Seven Points."[31] The decision to proceed with this schedule was made in January 1898, and over 4000 volumes were reclassified according to it by March of the same year.

During 1898 a schedule for classes E-F covering materials on the history of the Americas was also begun. But all reclassification work proceeded sporadically for the remainder of that year because the small staff had also to contend with an increasing number of regular acquisitions. And it was suspended altogether with the sudden death of John Russell Young in January 1899 and the subsequent appointment of Herbert Putnam as principal librarian the following April.

YEARS OF DECISION, 1899-1901

With the arrival of Putnam, the search for a resolution of the Library's classification needs took on a different character. The change occurred because Putnam, no mere novice in librarianship as Young had been, was aware of the role that a classification scheme adopted by the national library might assume. The question uppermost in his mind, therefore, was not, as it had been for Young, whether a new and better scheme was needed, but, in the words of Edith Scott (Hanson's biographer) "whether the Library of Congress should continue the development of its own classification, or, by adopting a nationally accepted scheme, foster standardization as in cataloging."[32] This meant restudying the schemes already dismissed and reviewing the work already begun. In Scott's opinion this especially meant the reconsideration of the *Dewey Decimal Classification* to see if it could by adopted. Dewey's scheme was used by more than one hundred libraries although many of them made special adaptations of it. Putnam felt that by using such a scheme the ultimate goal of standardization might be achieved.

Putnam took two years to make his decision. He involved himself and his staff in further study and extensive consultation regarding the matter. He also prepared for the eventual decision by asking for and receiving the funds necessary to hire the additional staff needed for the reclassification project. The chief difficulty in the consideration was the necessity that any scheme adopted be shaped to the particular needs of the collections of the Library itself. If the *Dewey Decimal Classification* were to be used, many changes would be required in it. But Dewey was unwilling to allow any significant changes. He believed that making alterations would be unfair to those libraries already using his system. Thus he required that it be adopted with only minor changes. Hanson and Martel both rejected that possibility. They argued against its adoption in a comprehensive report to Putnam in October 1900 where they supported their conclusions with the opinions of leading librarians they had interviewed at the Montreal ALA conference that year.[33]

Putnam eventually brought the matter to a head during the spring of 1901. He directed Martel to resume reclassification with the tentative E-F scheme already begun. In May, however, a final attempt was made to see if another scheme could be used. Consultations were arranged between the Library's staff and both Cutter and Dewey. Cutter consented to the Library of Congress making any changes necessary in his system. Dewey again adamantly held to his previous stance and after the visit made an impassioned plea to Putnam to accept his system without serious alteration. The real possibilities as shown in Martel's summary report were to adopt either the *Decimal* or *Expansive* systems with modifications or to proceed with a system of the Library's own making. Dewey disallowed the first possibility, and the incompleteness of the *Expansive* system removed the second. Therefore, Putnam gave the order later in 1901 to proceed with the work already begun and the new *Library of Congress Classification* was officially born.[34]

Putnam was not overly sanguine about the decision because it subverted his goal of national standardization in library technical matters.[35] Despite his disappointment, however, the ideals that he sought were not lost. The subsequent development of the *Library of Congress Classification* produced one of the most comprehensive efforts ever attempted at organizing library materials on the shelves. Methods were also eventually developed to keep it current. As a result, a large measure of the standardization that Putnam originally sought was accomplished in succeeding decades.

CLASSIFICATION DEVELOPMENT, 1901-11: GENERAL FEATURES[36]

The years from 1901 to 1911 constituted the single most important period in the development of the Library of Congress classification system. Hanson served as the head of the Catalog Division until he resigned to go to the library of the University of Chicago late in 1910. Classification development was supervised until 1910 by Charles Martel, the chief classifier. The application of the new scheme to nearly 1 million volumes by the end of this period brought about several important developments. First, by 1904 the final order and general contents of the main classes were established. This made necessary further alterations of Hanson's original tentative distribution of classes in 1899 in order to achieve a practical collocation of subjects fitted to the needs of the Library. In two outlines from 1901 and 1904 (see fig. 4) one can see something of the process of change that took place until the Library's new system had definitely assumed its own unique general arrangement independent of any existing system.

Second, the notation was changed significantly when, during the development of schedule D for Old World History in 1901, a second letter was added to denote subclasses. Because the same range of integers (1-9999) was retained for each double-letter subclass, the notational hospitality of the scheme was expanded enormously. The use of double-letters also made it possible to work on several parts of the schedules simulataneously. Under the older plan of providing a single letter with a single range of integers for each main class, the subclasses had to be developed sequentially because one could not anticipate the number of integers necessary for each.[37]

Third, the Library secured the services of an able team of specialists to work on the project. Some of these, such as William A. Johnston and A.F.W. Schmidt in history, and James D. Thompson in science, were classifiers by training and inclination. Occasionally, as in the later addition of Walter F. Koenig in languages and literature, the Library found one who would ultimately engage in significant scholarship in classification. Still others, such as Oscar G. Sonneck in music, brought a knowledge of the literature to be arranged although in Sonneck's case it was the expertise of a music dealer rather than that of a classifier. Many of the classifiers were versatile, working on whatever needed to be classified rather than confining themselves to narrowly defined specialties. Thomas W. Koch, for example, educated in philology and Roman legislation, worked principally on the

Figure 4

	1901		1904 (Final)
A(in part)	Polygraphy. General Works	A	General Works. Polygraphy
A 901-3000	Philosophy	B-BJ	Philosophy
A 3001-B	Religion & Theology	BL-BX	Religion. Theology
C	Biography, Studies auxiliary to History	C	History. Auxiliary Sciences
D	History (except America)	D	History. Universal & Old World
E-F	America. History & Geography	E-F	America
G	Geography & allied studies, Anthropology, etc.	G	Geography. Anthropology. Folklore. Manners & Customs. Sports & Games
H-J-K	Social Science, Economics, Political Science	H	Social Sciences
		HA	General Works. Statistics
		HB-HJ	Economics
		HM-HX	Sociology
		J	Political Science
		K	Law
L	Law	L	Education
M	Education, Sports, Amusements	M	Music
N	Architecture, Graphic Arts	N	Fine Arts
P	Music	P	Language & Literature
Q	Philology & Literature	Q	Science
			General, Mathematics, Astronomy, Physics, Chemistry, Geology, Natural History, Botany, Zoology
R	Science. General Mathematics, Astronomy, Physics, Chemistry	R	Medicine
S	Natural History. General Geology, Mineralogy	S	Agriculture
T	[illegible]ogy. Zoology	T	Technology
U	[illegible]icine	U	Military Science
V	Useful Arts. Agriculture, Manufactures	V	Naval Science
W	Engineering. Military & Naval Science		
Z	Bibliography	Z	Bibliography. Library Science

Adapted from LaMontagne, American Library Classification, pp. 234-35.

Fig. 4. *Library of Congress Classification* Outlines, 1901 & 1904

American history schedules (E-F) at the beginning. And Clarence W. Perley educated in engineering at the Massachusetts Institute of Technology, served as the chief classifier for more than two decades and did yeoman's work in preparing the language and literature schedules for the press.[38]

Ultimately the entire work was tied together by Charles Martel. Martel supervised the work of the team and provided general theoretical guidelines. He also contributed many of the particular shelflisting devices used

throughout the whole scheme and helped to create many of the individual schedules. Except for a short period in 1909, he served formally under the direction of J.C.M. Hanson as chief classifier from the beginning until 1910 when he became chief of the Periodicals Division. Even there, however, he retained the title of "general supervisor of the classification" while others directed the work of reclassification. In October 1912 he returned to the Catalog Division as its chief and became administratively responsible for all of the Library's efforts to achieve bibliographic control including its classification system. Beginning at that time, however, his relationship to the scheme became largely advisory, its general development already set.[39]

CLASSIFICATION DEVELOPMENT, 1901-11: COLLOCATION PATTERNS

During this period the most important element of the new classification to be developed beyond the general features just described was the general approach to subject collocation used within the scheme. This not only reflected the position that the scheme came to have among other general developments in classification, but also stamped the system with a uniqueness that remains its hallmark.

Likenesses with Other Schemes

The approach to subject collocation in the system had much in common with other schemes of the time. It clearly expressed the asssumption that the thorough and painstaking enumeration of particular subjects in a classificatory structure was the chief method of establishing control over a universe of subjects that seemed to have gone wild with growth and complexity. The view that the universe of subjects was undergoing rapid growth and becoming ever more complicated was one of the primary results of a growing tendency to equate subjects with the topical contents of books rather than with the logically derived elements of the general classification of knowledge. All that was necessary for any topic to be considered a legitimate subject was for it to be published. As a corollary, new books came to be identified as the source of new subjects. And with new books appearing in ever increasing numbers, it became impossible to escape the conclusion that new subjects were invading the once placid universe of knowledge like the advance of an unstoppable army.

The Library's new scheme, along with other systems of the same period, also expressed the conflicting assumption that regardless of how much the

universe of subjects might have grown, the enumeration and display of subjects in a classification system must be kept simple. There were several related sources for this conclusion. One was the continuing influence of an older and simpler view of the universe of knowledge where subject relationships, having been derived from a singular approach to subject subdivision, were relatively uncomplicated. Classifiers tended to adopt the simpler model for new systems they created. Another source was the growing influence of the idea of user convenience on the shaping of library bibliographic tools. User convenience ideally meant that the structure of such tools should reflect the thinking process of the readers who would use them. In actual practice it meant using simple patterns of order—for example, those based on alphabetical, chronological or geographical arrangement—primarily because they were thought to be easily understood by readers.

A final source was the changing social tenor of the times, particulary that element of it that increasingly stressed the need for practical solutions to social and organizational problems. Classification work at the Library of Congress had been no stranger to practical solutions during its earlier history. Under the leadership of J.C.M. Hanson, however, the stress on practical solutions became more pronounced. Hanson was ultimately responsible for the direction that the new classification took, even though its details were actually the work of Charles Martel. And Hanson was more than anything else a notable example of the new breed of organizational technicians coming into library work. In method he was eclectic, borrowing freely from a variety of sources, his chief concern not being the purity of the logic behind a system but whether it would achieve an appropriate balance between economy of effort on the part of its makers and effectiveness for its users. Furthermore, the Library needed this kind of an approach. Because of the enormous amount of both retrospective and current work to be done, it was under pressure to achieve usable results quickly. In that context, the simple enumeration and display of subjects was an organizational necessity. Simplicity in the enumeration and display of subjects expediently avoided classificatory structure that, while perhaps more philosophically correct, would have delayed the creation of the system, in favor of that which could be easily completed and still claim a great deal of practicality and usefulness for all concerned.

A Unique Departure

The subject collocation patterns of the Library's new scheme also represented a unique departure. Previous classifications had arisen from a

tradition that considered the universe of knowledge to be a unified and cohesive whole. This tradition was carried over into classification structure in the form of a quest to identify a single fundamental principle of subject order which, when discovered, would provide a uniform basis for subject collocation in all parts of the scheme. In contrast, the *Library of Congress Classification* was created by persons who appear to have been educated more directly in the modern tradition in which the universe of subjects, while ideally unified and cohesive, was practically viewed as a conglomeration of more or less discrete fields of knowledge. New areas constantly came into existence and developed at their own rates. And individual fields were considered to be the products of the scholars and students who worked in them. One corollary of this point of view for classification development was that there was no overall principle of subject organization that applied to all fields. Instead, the subjects of each field grew and were related to each other according to principles appropriate to the field in which they were found. Another corollary was that, given the growing forcefulness of the idea of user convenience in library thought, the best collocation pattern for any particular field was that which could be rationalized as best serving the interests of the specialists within it and other readers who might use it.[40]

A Fundamental Tension

The foregoing features which the Library's new classification scheme had in common with other contemporary development, when combined with the new departure of recognizing the relatively discrete nature of individual fields of knowledge, created a fundamental tension in the scheme's approach to subject organization. On the one hand, strong measures were taken to provide the scheme with an overall structural unity. These measures, present in the form of common arrangement patterns used throughout the system, expressed the idea that the scheme was a singular entity, a general classification system that dealt with the entire universe of knowledge in a cohesive and relatively simple fashion. On the other hand, equally strong measures were taken to provide the greatest degree of latitude possible in the enumeration and arrangement of the subjects that made up individual fields of knowledge and subject area. These measures expressed principally in the individualized adaptation and tailoring of common arrangement patterns to particular schedules and their parts, ensured that the specialized nature of individual fields of knowledge and their subject organization could be served. The collision of these two types of measures produced an approach to subject collocation that was thoroughly different than that found in any classification scheme produced up to that time.

Common Arrangement Patterns[41]

Common subject arrangement patterns applied throughout the classification scheme to preserve a simple but cohesive structural unity were of two kinds: (1) a general arrangement pattern developed over the first decade of the scheme's development and labeled by Martel in 1911 as his "seven-point" structure of topical organization; and (2) a series of practical arrangement devices used within the context of the general pattern.

The general arrangement pattern consisted of seven categories or clusters of kinds of materials. The first six consisted of general materials related to the subject area, the seventh of materials on specific subdivisions of the topic. By regularly placing the first six categories of materials before the seventh, the classification scheme adopted the practice, already well-established among other classification work of the time, that general treatments of a topic should always precede treatments of a narrower portion of the whole.

The first six categories of materials were themselves based on characteristics related either to the form in which the materials were published or to an "aspect" of the entire topical area that the items treated.[42] The first, General form divisions, included serial and periodical materials, collections, and works such as dictionaries and encyclopedias that dealt with definitions. This category was generally the first to be enumerated in any topical area. And periodicals and serials were almost always placed first within it. The other five categories of general materials—philosophy and theory; History; General works and treatises; Law, regulations, and state relations; and Study and teaching—followed the general forms divisions materials without any prescribed order to their appearance. By applying this general arrangement pattern to subject areas of all sizes—that is, from those that encompassed entire schedules or even multiple schedules to those of very small extent (including especially the individual subtopics found in the seventh category of still larger subject areas)—a general structure was provided in which the second kind of common arrangement patterns might be applied.

The second kind of common arrangement pattern consisted of a series of practical devices. Some of them could be considered patterns of common sense or general knowledge; others were arbitrarily devised; but all were fundamentally simple in their structure and application. The most important were alphabetical order, chronological order, geographical order, language or nationality order, and specific sequences for works related to particular persons and for materials related to particular works. They were

used within the seven-point general arrangement pattern as the dominant methods of subarrangement. Further, where the number of materials gathered under any one of the seven basic groups was large, the practical devices were ordinarily intermixed in a variety of creative and useful combinations.

Neither the practical devices nor the seven-point general arrangement pattern were applied in a rigid manner. The latter, for example, did not employ complete sets of standard subcategories for each category in the pattern. Nor were there standardized lists of countries, time periods, languages, etc. applied in instances where practical devices were used. Instead, all common arrangement patterns were applied in a variable or expansive way. In some instances, only the barest framework of a particular pattern was evident, while at other times, the full pattern was employed. In still other instances, the full pattern might be augmented with innumerable special subdivisions. The basis for such variable use was not, however, the lack of appreciation for standardization with respect to classification structure. Instead it was a function of the second aspect of the fundamental tension in the system—the goal of arranging the subjects of each area of knowledge in a unique or tailored manner.

Adaptation for Particular Subject Fields

The goal of arranging the subjects of each field of knowledge in a unique manner was the rationale behind variations in applying both the general arrangement pattern and the practical devices that were subsidary to it. Variations may in turn be viewed in terms of the two basic parts of the general pattern: the special subtopics of a subject area (i.e., the seventh of Martel's seven categories) and the general materials of any particular subject area (i.e., the first six of Martel's seven categories).

The seventh category of materials in the general arrangement pattern was that which listed the special subtopics and subdivisions of a particular subject area. It was ordinarily arranged by whatever ordering logic seemed appropriate to the classifier assigned to that particular area. The classifier attempted to arrange this category in each subject area in a manner that responded both to subject field integrity and to practicality and simplicity in enumeration. Because of this approach, the seventh category of materials in the general arrangement pattern bore a wide variety of individualized collocation patterns throughout the entire system. Some ordering logics that were standard among other classification systems were occasionally used. For example, in areas such as biology and zoology, the order

followed then current taxonomic structure as it did in other classification systems. In the areas of history and political science of individual countries, the arrangement of the seventh category in the pattern was geographical as it typically was in other schemes. In most subject areas, however, arrangement appears to have been based, at least in part, on trends evident in the way experts viewed their own disciplines.

In only two respects does there appear to have been some overall control over enumeration in this part of the general arrangement pattern. The first consisted of a repetition of the seven-point general arrangement pattern to subarrange materials related to particular subclasses listed within the seventh category. When the amount of materials in a particular subclass listed within the seventh category was large, that subclass was itself subarranged according to the general pattern—general works enumerated as categories one through six coming first and specific subdivisions of the subclass following. The second form of control over enumeration in the seventh part of the general arrangement pattern was the regular use of practical arrangement devices as a way to subarrange subjects, especially at more specific levels of the scheme. In other words, where other logics might provide an overall order to the seventh category for a very broad subject, specific and detailed subclasses eventually required the use of the practical devices.

Individualization of subject collocation within particular fields was also achieved by incorporating variations in the first six categories of Martel's seven-point pattern and in the use of the practical arrangement devices. Two factors controlled these kinds of variations. The first was the relative size of the subject field in terms of the amount of general materials to be classified. In subject areas such as Education (L) and Political science (J) which had many general materials, the first six categories were spread over several double-letter subclasses and were enumerated in great detail. In subject areas with fewer general materials, the first categories were enumerated in a more sketchy manner. In subject areas with almost no general materials, the first six categories were often allowed to coalesce into the single subcategory "general works" which stood for any item that would ordinarily have been included in the first six categories.

The same expansive or coalescing approach to enumeration was used with the practical devices. For example, when only the barest structure of historical chronological periods was needed, classifiers used a minimal number of historical subcategories. When, however, the number of materials was larger, the pattern was regularly expanded by incorporating arrays of more specific time periods. The most important consideration in

the process was determining what was needed for the materials at hand. The same reasoning dictated why geographical subdivision patterns varied so greatly throughout the scheme. A classifier simply did not need to enumerate all the countries of the world nor was there need to enumerate them in the same way if they were unnecessary for the topic at hand. As more materials were acquired which necessitated greater detail in subdivision, the expansive nature of these various patterns would allow new subdivisions to be inserted at their appropriate places.

The second factor controlling the variable enumeration of general materials categories and practical devices was the peculiar needs of the subject area itself. For example, only a relatively limited number of subject areas—notably, those in the Social sciences (H-L) and in Medicine, Agriculture and technologies (R,S,T) had general materials on the aspect "Law, regulations and state relations," the fifth category in Martel's seven-point pattern. Where not needed, it was not listed. In contrast, the fifth category was so important to topics such as Education (L) and Forestry (SD), that one will not only find it enumerated in great detail, but also removed from the general materials section altogether and placed with the specific subdivisions (i.e., the seventh category in the seven-point pattern) of the respective subject areas. In many other places, the terminology used to indicate general categories of materials or specific elements of those groups was changed to reflect the special slant of the topical area itself. This is evident, for example, in the addition of works on "Forest conditions" to the history category of Forestry (SD) and of works on voyages and expeditions to the General form divisions of Geology (QE).

The most obvious effect of adapting or tailoring the common arrangement patterns of the system to the subject collocation needs of particular fields of knowledge was to make the system appear unsystematic and even disorderly when viewed in the form of its printed schedule texts. In that form one found few of the marks of symmetry common to other notable schemes of the time—such devices, for example, as Dewey's standard subdivisions or Cutter's standard list of countries, both of which functioned as obvious system-wide arrangement patterns. The Library's new scheme had no similar system-wide devices because its emphasis on adaptation to particular fields of knowledge made standardized system-wide devices of that kind inappropriate.

This seeming lack of overall systematic order was further exacerbated by the fact that the seven categories of materials that comprised the general arrangement pattern—the key to the scheme's internal structure—were not always labeled as such in the schedule text. In fact, their identity as clusters

of materials was never adequately explained to classifiers. This lack of explanation is important because Martel's list of caption labels for the categories, if interpreted literally as indicative of only what the labels themselves mean, would suggest that there was little or no general arrangement pattern at all in the scheme; that, at best, the scheme began with a basic but limited number of identified types of materials and then sandwiched others between them without explaining why they were subject to notable variations. Finally, not even the practical arrangement devices which were employed throughout the scheme and which were the most visible attempts at the use of standard patterns of arrangement, helped to alleviate the sense of disorder that a classifier encountered. The reason for this was that the practical devices were not only used in widely varying ways but were sometimes so intermixed as to make them unrecognizable. Even more important, the practical devices were actually subsidiary to the general pattern arrangement. Because that pattern was not obviously marked, the practical devices were themselves severed from any basic pattern of order.

Despite the appearance of disorder in the Library's scheme, it retained a high degree of structural integrity. It also had a considerable amount of redundancy and symmetry in its use of arrangement patterns. But the redundancy and symmetry of the Library's scheme were not found as system-wide patterns. Instead, they were limited to sections of the scheme such as single schedules or to groups of schedules that approximated specialized areas of knowledge. One will find, for example, that the arrangement of the materials related to the history of particular countries (D-E-F) forms a definable pattern that varies for the most part only in the time periods required for each country and in the amount of detail necessary at very specific levels. The same may be said of the political science materials of particular countries (J) and of the materials related to particular philosophers (B) and particular educational institutions (L). The two latter examples are important because they illustrate the practice of capturing a repetitious collocation pattern applicable to a section of the scheme in the form of a set of auxiliary tables. The tables represented a single pattern enumerated in differing degrees of fullness that were then to be applied throughout the section. They were limited in application to the portion of the scheme for which they were devised, however, rather than being applicable throughout the entire system.

Summary

Collocation patterns employed in the foregoing manner represented a striking extension of the task of classification. Other schemes, having

begun with a model in which the universe of knowledge was conceptualized as a unitary and cohesive structure, made the collocation patterns of particular subject areas subservient to that idea. In practice this meant that the enumeration of individual subject areas was made to fit the standardized arrangement patterns that preserved the symmetry of the entire scheme, regardless of whether that met the collocation needs of each such area. In contrast, the new scheme of the Library of Congress, while tacitly recognizing the ideal of a unitary universe of subjects, assigned an even greater importance to recognizing the unique character of particular fields of knowledge. Furthermore, instead of enumerating the subjects of particular areas to fit standardized collocation patterns that preserved the model of a unitary and symmetrical scheme, classifiers at the Library adapted standardized collocation patterns to serve what was considered to be the special needs of the particular areas of knowledge. By approaching the subject access task this way, classifiers at the Library were able to grapple more readily with one of the most significant changes to overtake subject access work during that period—the rise of specializations in the world of scholarship.

The practical work of encapsulating this change in how fields of knowledge were viewed in a classification scheme represented little more, of course, than a first step in a new direction in subject classification work. More important, the resulting scheme incorporated serious weaknesses that would only become apparent in future decades. The idea of special areas of knowledge, which was only at an early stage of development when the Library's scheme was being created, would later become so extended that what Hanson and Martel considered an adequate breakdown of the entire universe of knowledge in terms of special fields would later be considered as rigid and unacceptable to change as earlier schemes must have seemed to Hanson and Martel. In the same way, the willingness of the architects of the Library's scheme to appeal to the idea of user convenience as a rationalization for particular collocation decisions would later be extended in a way not envisioned in the beginning, eventually becoming as much a weakness to the growth of the scheme as it had once been a strength. Finally, the lack of a plain method of marking the scheme's internal structure would eventually lead to disregard for that structure in favor of increasing numbers of decisions about subject collocation that were without any systematic basis. Hanson and Martel would have had little awareness of such future developments, however. For them, the collocation patterns they devised must have seemed a singular triumph.

PROGRESS ON THE CLASSIFICATION: 1901-11

Actual progress on the classification during its first decade can be viewed in terms of three interrelated activities: (1) the development of tentative schedules; (2) the reclassification of the existing collections and the classification of new works under the provisions of the tentative schedules; and (3) the preparation of the schedules for publication.

Tentative Schedules

The process began with the development of tentative schedules. The arrangement of the books of each subject area in the general order of the older Jeffersonian system provided a starting point for the consideration of the new arrangement. Bibliographies, treatises and comprehensive histories related to the subject area; catalogs of existing collections; the schedules of other general classification schemes; and, occasionally, the views of specialists outside the Library were also available for determining the scope and topical sequence of any particular subject area. In addition, the sheer physical activity of sorting books into groups may well have played an important role in the process. This is suggested by the fact that a significant number of the categories in Martel's basic seven-point arrangement pattern are precisely those categories which would be most obvious in the physical handling and visual examination of books—the physical publication format of items or such aspects of book topics as their history, philosophy, or study and teaching, each of which is commonly represented by prominent title keywords. Eventually, these various sources of information led to an initial, though tentative, arrangement and notation which was then set forth in the form of a working draft.

Reclassification and Classification

After a tentative arrangement was established, the second activity of the process began—the actual classification of the books at hand. Classification involved assigning appropriate class symbols to each work and shelf listing the individual volumes within the classes. It started with the reclassification of the older works in the collection. But as the numbers of older books to be reclassified diminished, increasing numbers of current acquisitions could then also be classified until, eventually, almost nothing remained except current purchases.

The second activity, particularly the reclassification of the older collection, also served as a test of the tentative arrangements because it enabled the

classifiers to identify places where changes were needed. The process of classification was clearly experimental and largely inductive in this respect. Martel later emphasized this when he described the revised schedules that were derived from the process as "the results of the experience gained both in the first application of the schedules in reclassification and in later continued use in classifying new books."[43] He went on to note, however, that the classifiers were actually guided by a very practical consideration. The details of arrangement were to be based on the books themselves—i.e., on characteristics actually and obviously in the books that would produce appropriate and useful classification categories—rather than on some ideal or theoretical structuring of a particular subject area. Martel wrote:

> A certain ideal was kept in view but it was a practical one. The ambition was to make the best of an unrivaled opportunity and to produce a classification in which the theory and history of the subjects as represented in a great collection of books should constitute the principal basis for the construction of the scheme, compared and combined of course with their presentation as derived from other classifications and treatises. It was recognized beforehand and confirmed over and over again in the course of the undertaking that no amount of preliminary study, consultation and taking pains in the preparation of the provisional draft could produce other than a largely theoretical scheme, more or less adequate and unsatisfactory until modified in application. A clearer and wider view of many a problem provisionally disposed of would often present itself as class after class was conscientiously worked over, discovering new aspects and relations of certain subjects or the same relations in a different light and making it desirable and sometimes necessary to revise an earlier decision and adopt a better solution.[44]

Making the books themselves the practical focus of the classification process had the positive effect of closely tailoring the resulting scheme to the specific needs of the book collections at hand. But it also had the negative effect of limiting the scope of the scheme by not requiring the elaboration of subject areas or the specification of topics if they were not needed. To the extent that the collection itself was skewed in its proportions, so also did the scheme become skewed rather than balanced and symmetrical in its overall structure.

Focusing primarily on the books themselves also affected the treatment of large numbers of books that represented combination topics. Combination topics were those that brought together closely allied subjects from different general classes. Martel found such combinations to be particularly troublesome because they made it necessary to decide under which of the combined subjects a book should be placed. Unlike catalogs which could

represent particular books in more than one place or at least to refer easily from one part of a combination topic to another, shelf classification had to choose between the topics because books could not be physically present in more than one place. But choosing between the topics appeared in turn to undercut the commonly understood goal of classification to gather together all the books that treated the same subject because regardless of which subject in a combination was chosen for the gathering point, scattering would occur from the standpoint of the other topic.

Martel noted that the scattering of some subject combinations was inevitable. He appears to have had in mind such works as those on the history, or the study and teaching of, say, chemistry and insurance, which ordinarily would be entered as aspects in the chemistry and insurance sections rather than being gathered together under history and education. In his thinking, scattering of this kind was justified because "different phases of the same subject may be of primary interest in different classes, and the formula 'one subject one class' does or should not apply in such cases."[45]

Of course, considering History, and Study and teaching as aspects of other subjects and not primarily as subjects to be gathered together in their own right was an established convention by the turn of the century. Within the enumerative classification movement of which the Library of Congress Classification was a part, however, it was rapidly being discovered that not only did countless other such combinations exist but that they were "continually formed in new variety." And for each new combination discovered, a decision had to be made as to which was to be considered the primary subject and which the aspect that should be scattered. In the development of the Library's scheme, making such decisions became part of the general inductive and experimental process. Furthermore, the final choices especially depended on the kinds of works involved—whether, for example, they were scientific treatises in which the disciplinary orientation of the aspect topic was clear, or popular works in which the orientation was blurred. Martel's description of the process is instructive not only because it portrays how strong the tendency was to try to find gathering points for various topics but because of the obviously pragmatic rather than systematic procedure involved.

> There is for example the literature of "Town and city planning" belonging to Engineering, Architecture, Economics, Sociology, Political science and History. These classes are represented by scientific treatises as a rule typical and well defined in scope. But there are numbers of popular works of mixed character tending to obliterate the distinction between the groups classified in different places. After a time the general (mixed) literature of such subjects may take a more or less decided turn

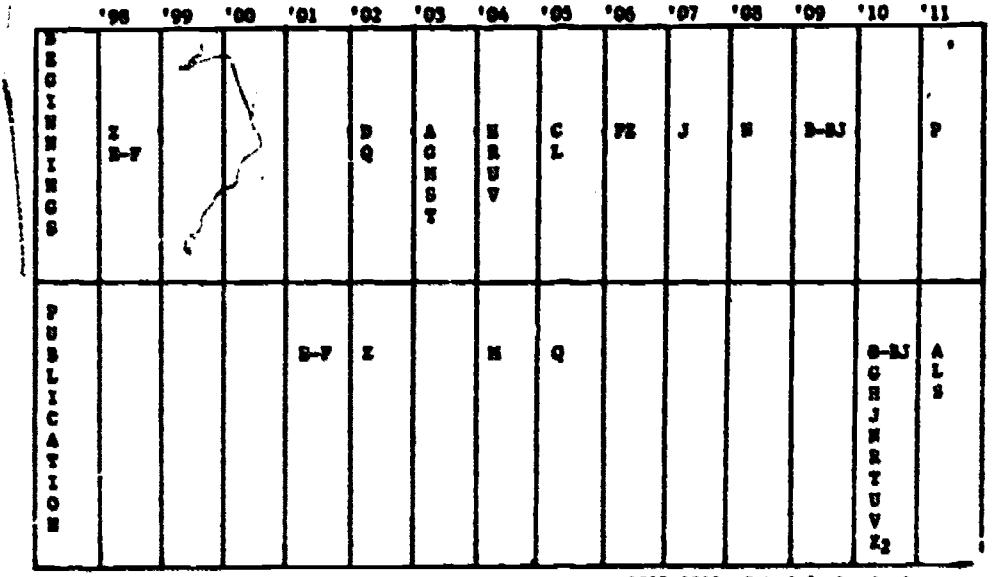
> toward one or another of the special classes which may then be fixed upon as the general or main place, and it may become advisable to abandon some of the special classifications turning them into references, and preferring but one place for the books on the shelf.[48]

One striking result of the foregoing procedure was to place certain topics in locations that were illogical when compared to what a systematic approach might have dictated. Another result was to greatly extend the process of creating new schedules by putting off the final acceptance of any particular schedule until the need abated to incorporate new subject placement decisions that arose as other subject areas were arranged. Extending the process of creating finalized schedules was unavoidable because limits in the size of the Library's classification staff and the press of other duties made it necessary to develop different parts of the new scheme in a sequential manner rather than all at the same time. That sequence, portrayed in figure 5, generally followed the order: History, Science and Technology, Social science, and, finally, Fine arts, and Language and Literature. Sequential reclassification meant that the way one subject area impinged on another might not even be known until weeks, months or even years had passed. Accordingly, decisions regarding the placement of books on combination subjects would then have to be corrected at those later dates when conflicts became apparent or when a final gathering point became clear. Some indication of the amount of that kind of change is reflected in the number of "transfers" recorded during the first decade (see fig. 6). Transfers indicated the movement of volumes from one place to another after reclassification had been in progress. During the years 1903-10, when reclassification accounted for an average of about 68,000 volumes annually (an annual average of 46% of all classification work), transfers amounted to an annual average of more than 7000 volumes or almost 5% of all classification work and nearly 11% of all reclassification work (see fig. 6).

Publication

The third and final interrelated step in the creation of the new scheme was the publication of the individual schedules. Publication was an important step because it represented the completion of a schedule—i.e., the point at which the number of changes in a schedule fell to a low enough point for the classifiers to accept it as a final or nearly final version. For the four schedules issued by 1905 (E-F, Z, M, and Q—see figs. 5, 7) this appears to have been a natural process, because there does not appear to have been any other pressure for publishing them. The publication of still other schedules occurred, however, not because they had reached a state of complete

Figure 5



Source: Annual Report(s) of the Librarian of Congress, 1898-1911. Schedule beginnings reflect the first time reclassification figures for them appeared in the annual reports, not necessarily when the schedules were first planned.

Fig. 5. Initial Library of Congress Classification Schedule Beginnings and Publication Dates, 1898-1911

acceptance by the classifiers, but rather because Herbert Putnam, the librarian of Congress, found it expedient to have them issued.

As noted earlier here, Putnam was not originally sanguine about the Library's development of its own scheme. He was also more than aware of the uniqueness of his Library's new shelf system. In later contrasting that uniqueness with the Library's card catalog, he stated:

> In contrast with the card catalog of the Library which owing to the sale of the printed cards is a matter of general concern to libraries, the classification of our collections was assumed to be of concern solely to ourselves—that is, to the efficient administration of the Library within itself. Upon this assumption the scheme adopted has been devised with reference (1) to the character and probable development of our own collections, (2) to its operation by our own staff, (3) to the character and habits of our own readers, and (4) to the usages in vogue here, a distinguishing feature of which is the freedom of access to the shelves granted to serious investigators.

Figure 6

	1903	1904	1905	1906	1907	1908	1909	1910	Total Vols.	Ave. @ yr.	% Ave. @ yr.
1. Reclass'n	94.6	77.3	46.0	56.5	67.1	67.5	68.2	66.6	543.8	68.0	46.3
2. Transfers within New Class'n	1.7	6.0	11.3	12.9	9.6	8.8	3.5	3.3	57.1	7.1	5.0
3. New Acces'ns in Old Class'n	37.7	46.1	37.7	35.7	31.0	26.9	17.4	18.7	251.2	31.4	21.6
4. New Acces'ns in New Class'n	15.9	27.2	37.0	32.6	37.2	42.7	61.3	63.2	317.1	39.6	27.1
5. Total New Accessions Classified	53.6	73.3	74.7	68.3	68.2	69.6	78.7	81.9	568.3	71.0	48.7
6. Total all Class'n Work	149.9	156.6	132.0	137.7	144.9	145.9	150.4	151.8	1169.2	146.2	

Source: Annual Report(s) of the Librarian of Congress, 1903-1910
Note: Line 5 is a total of lines 3 and 4. Line 6 is a total of lines 1-4.

Fig. 6. LC Classification Production, 1903-1910 (Volumes in thousands)

> With these considerations the resultant scheme, while organic in the sense that certain fundamentals were the basis of each schedule, is unsymmetrical, since each schedule was devised with reference to its own utilities (as applied to that particular group of material) rather than with reference to its proportionate part in an integral whole.[47]

Because of the uniqueness of the scheme, neither Putnam nor the Library's staff considered it likely that other libraries would find it of more than passing interest. They were surprised, therefore, that from an early date a stream of inquiries were received regarding it. Some librarians simply wanted to be able to use it as a reference tool in order to determine how the Library of Congress dealt with particular subjects. For others, the scheme was useful for explaining the meaning of the new classification numbers that began appearing on the printed catalog cards made available by the Library. Finally, there were libraries that even by the end of the decade had decided to adopt the system for their own use. For the latter, finding information about the particular schedules was important. The only way the Library could meet such requests was cumbersome—circulating extra

Figure 7

1901-1905	1910-1911	1912-1930 New Schedules	1912-1930 Revised Editions
	A (1911)		A_2 (1915)
	B-BJ (1910)		
		BL-BX (1927)	
		C (w/out CR) (1915)	
		D (1916)	
		D501-659, WWI (1921)	
E-F (1901)			$E-F_2$ (1913)
	G (w/out GR-GT & maps, etc.) (1910)		G_2 (w/out maps, etc.) (1928)
		GR-GT (1915)	
	H (w/out HT) (1910)		H_2 (1920)
		HT (1915)	
	J (1910)		J_2 (1924)
	L (1911)		L_2 (1929)
M (1906)			M_2 (1917)
	N (1910)		N_2 (1917) N_3 (1922)
		P-PA (1928)	
		PB,PR,PS,PZ (1915)	
Q (1902)			Q_2 (1912) Q_3 (1921)
	R (1910)		R_2 (1921)
	S (1911)		S_2 (1928)
	T (1910)		T_2 (1922)
	U (1910)		U_2 (1928)
	V (1910)		
Z (1902)	Z_2 (1910)		Z_3 (1927)
		Additions & Changes (1928-)	

Fig. 7. Library of Congress Classification Schedule Production, 1901-1990

typescript drafts of individual schedules to other libraries with the provision that they could copy them. In 1910, in order to meet the need, Putnam ordered the remaining schedules printed regardless of the state they were in.

Hanson and Martel were not enthusiastic about the decision because it forced the acceptance of schedules that in their opinion still needed significant improvement through experimentation. Martel later couched this concern in terms of degrees of perfection that might have been obtained:

> It may be admitted that with all the efforts spent in improving the schemes in the light of further experience an approach to the ideal in mind has been realized if at all only in a slight and imperfect degree. On the other hand that degree might have been advanced materially if printing could have been postponed until all the schedules were completed. Many omissions, imperfections and inconsistencies might have been eliminated if there had been more time.... Whether the principle adopted and the manner and extent of its application were in the line of progress remains perhaps for the future to demonstrate.[48]

The reason the process of bringing the schedules to a better state took so long was the need for the classifiers to divert their energies to other needed activities, not the least of which was classifying the increasing numbers of current acquisitions. From 1904 to 1908 these ranged from about 68,000 to nearly 75,000 volumes a year (see fig. 6). New acquisitions of that magnitude represented nearly one-half of all items classified and a significant increase over earlier years. The chief difficulty in dealing with new acquisitions was that where the new scheme was unfinished, new materials had to be classified in the older scheme that was being supplanted. This constituted a double effort because publications placed in the older scheme would later have to be reclassified into the new one. The number of volumes that had to be handled in this manner may be seen in the yearly totals for "new accessions in old classification" (see fig. 6).

Despite these difficulties, a concerted effort produced twelve new schedules and one in a second edition during the years 1910 and 1911 (see figs. 5 and 7). Premature publishing left two of the schedules incomplete (G lacked subclasses GR-GT and provisions for maps and atlases; H lacked subclass HT); and another (A) was sufficiently provisional in nature that a revised edition had to be issued shortly thereafter. Still, even Martel, impressed by the progress being made, predicted in mid-1911 that all the remaining schedules would be completed within a year.[49] As it turned out, that goal took several more decades.

CLASSIFICATION DEVELOPMENT: 1912-30

The years from 1912 to 1930 constituted the second era in the growth of the new classification system of the Library. This period was marked by three important characteristics that affected the scheme: (1) the decline and

slowdown in reclassification production, (2) changing general conditions within the Library, and (3) increased difficulty in reclassification itself.

Decline and Slowdown in Reclassification Production

The most obvious characteristic of the second era is that the reclassification of the older collection declined and slowed. This factor is reflected in reclassification production totals for the period (see fig. 8). For the years 1911 and 1912, the number of volumes reclassified annually dropped by almost one-half to an average of 36,000 volumes a year—32,000 volumes less than the annual average of the previous eight years. Thereafter, totals fell at a steady rate. The annual average for 1913-15 was just over 19,000 volumes; for 1916-21, just under 14,000 volumes; and for 1922-29 just under 5000 volumes. After the latter date, reclassification totals became negligible.

The decline in those totals was not unusual because any reclassification project is expected to eventually wind down. Here, however, the decline also represented a notable slowdown. An estimated 670,000 volumes had been reclassified between 1898 and 1911, and of that total about 620,000 volumes were completed during the ten-year period from 1902 to 1911.[50] But, it took another ten years (1912-21) to add only another 174,000 volumes to the original total. And from 1922 to 1929, just before reclassification totals became insignificant, barely 35,000 additional volumes were completed. In other words, 17 additional years were required to add approximately one-third again as many volumes as had been reclassified during the first decade of the twentieth century.

The general slowdown particularly affected the reclassification of two principal sections remaining in the project: Languages and literature, and Religion.[51] The first of these areas (schedule letter P) was begun in 1906 with the reclassification of fiction in English (PZ). General literary studies and English and American literature (PN, PR, PS), particularly the latter which Martel considered, "the most important from the standpoint of the reference service and the service of the printed catalogue cards,"[52] were begun in 1909, completed early in 1912, and accounted for an estimated 25,000 to 30,000 volumes. Reclassification of these sections also did away with the largest single remaining group of current acquisitions regularly added to the old classification. But the remainder of the P section was not completed until 1921. Reclassification of works on Religion was not begun until 1917. It took twelve years (1917-28) to convert some 81,000 volumes to

Figure 8

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	Total Vols.
1. Reclass'n	38.5	33.4	22.2	17.2	18.6	11.3	16.2	14.1	17.9	13.0	10.2	212.6
2. Transfers within New Class'n	5.9	2.6	1.8	4.7	5.8	6.1	4.6	2.7	2.6	3.4	2.4	42.6
3. New Access'ns in Old Class'n	18.6	7.6	5.3	6.6	6.3	7.0	6.2	2.6	2.8	1.9	1.0	65.9
4. New Access'ns in New Class'n	52.6	66.5	76.3	74.2	70.4	79.9	73.3	55.1	55.8	63.4	68.7	738.2
5. Total New Accessions Classified	71.2	74.1	81.6	80.8	76.7	86.9	79.5	57.7	58.6	67.3	69.7	804.1
6. Total all Class'n Work	115.6	110.1	105.6	102.7	101.1	104.3	100.3	74.5	79.1	83.7	82.3	1059.3

	1922	1923	1924	1925	1926	1927	1928	1929	Total Vols.
1. Reclass'n	8.1	4.3	2.3	7.4	4.4	5.0	3.1	.6	35.2
2. Transfers within New Class'n	2.4	1.6	2.4	2.5	1.5	2.3	2.6	2.1	17.4
3. New Access'ns in Old Class'n	.9	.7	1.0	1.0	1.5	1.5	1.5	1.3	9.4
4. New Access'ns in New Class'n	70.0	68.5	70.7	67.6	82.9	79.5	82.0	89.1	610.3
5. Total New Accessions Classified	70.9	69.2	71.7	68.6	84.4	81.0	83.5	90.4	619.7
6. Total all Class'n Work	81.4	75.1	76.4	78.5	90.3	88.3	89.2	93.1	672.3

Source: Annual Report(s) of the Librarian of Congress, 1911-1929
Note: Line 5 is a total of lines 3 and 4. Line 6 is a total of lines 1-4.

Fig. 8. LC Classification Production, 1911-1929 (Volumes in thousands)

the new scheme and that did not account for all of that class. Other sections of lesser extent such as the remaining sections of schedules C, G and H also took extended periods of time to complete.

Changing Library Conditions

The decline and slowdown of reclassification were ultimately related to changing general conditions in the Library. Personnel changes and losses were notable during the entire period. During the war years (1917-18) significant numbers of the entire library staff left for war service and from 1919 to 1924 low salaries caused a high turnover rate particularly among lower level personnel. In 1921 alone, 15 of 19 classification division employees (mostly shelflisters, etc.) transferred out of the section or, as was more often the case, left the Library altogether for positions elsewhere that were estimated to pay salaries from 20% to 100% higher. Federal reclassification of library positions in 1925 served to stabilize the staff and enable the Library to obtain a better grade of personnel. But staffing among departments continued to be uneven. For example, increases in the staff of the Cataloging Division, made to accommodate a significant rise in new acquisitions, were not matched by staff increases in the Classification Division. In order for the latter to keep up with the work of the Cataloging Division on new accessions, reclassification work was all but discontinued beginning in 1929.[53]

Increases in new accessions, of which the significant rise in the mid-1920s was only one example, formed another important general condition that affected the reclassification project. The classification of new accessions during the period from 1903 to 1910 had averaged 71,000 volumes annually, although for some of those years more than one-half of the new accessions had to be placed temporarily in the old classification scheme. From 1911 to 1917 the yearly average jumped to nearly 79,000 volumes, by then more than 90% being placed in the new scheme (see fig. 8). After two low years (1918-19) at 58,000 volumes annually, the yearly average again rose. In 1926 it jumped to well over 80,000 volumes, and in 1929 it topped 90,000 volumes. The expansion of the collection was an important expression of the Library's fundamental purpose. But dramatic increases in new accessions, when combined with the personnel difficulties already noted, could only have had dire results. For example, neither the Cataloging Division nor the Classification Division could process all of the new accessions. As a result, a significant backlog of uncataloged and unclassified new accessions began to accumulate by the end of this period.

Reclassification and work on the new scheme were affected even more directly. For example, the reclassification of religious materials came to a virtual standstill during the last half of 1921 and its shelflisting lagged

seriously behind during other years. The 1921 situation prompted Clarence W. Perley, the division chief, to express some of the frustration involved:

> Should this condition not improve in the coming year some change of policy would seem to be indicated. The work of reclassification should not, in our opinion, be halted for the sake of putting on the shelf miscellaneous material of inferior quality.[54]

The situation did not improve substantially so that eight years later Perley could report little more than the same situation:

> With the recent substantial increase in our catalog division which our classification division has not shared but has been obliged to follow, with unequal steps, we have been hard pressed to keep up with the daily routine of classification with little or no time for improving our schemes, except as new subdivisions were actually forced upon us.[55]

Personnel changes and significant increases in new accessions directly affected the reclassification project and work on the new scheme. An indirect factor that affected both matters was the expansion of the Library's overall program to include other activities and programs. One of the most important of these was the creation of the Legislative Reference Bureau in 1914. Another was the Library's involvement by the late 1920s in cultural programs. And still another was the Library's acquisition of foundation grants for special bibliographical projects. None of these programs caused any new policy to be formulated with respect to reclassification and the new scheme. But they did stand as reminders that there was more to the Library than simply the technical organization of its collection. And to the extent that such programs captured ever larger proportions of the Library's administrative support, interest and operating funds, the reclassification project, and with it the finishing of the classification scheme, was bound to suffer.[56]

Increasing Difficulty in Reclassification

A third major characteristic of the period from 1912 to 1930 that affected the development of the new classification scheme was the growing difficulty of the reclassification process itself. During the first decade or so, reclassification often dealt with large blocks of materials that were transferred to the new schemes in a relatively direct way. These kinds of materials were comparatively easy to reclassify and accounted for much of the early accomplishments of the project. This situation was particularly the case with large groups of materials on related subjects such as those in some of the sciences, and with large collections of similar forms of materials such as

the serial documents of subclass J in Political Science. They might well have needed rearrangement within the block, but at least they constituted cohesive groups and could be reclassified en masse.

As the subject areas with these related kinds of materials were completed, those that remained were the more difficult items to classify consisting of specialized works that were drawn from various places in the older scheme. These materials often required the creation of either new classes or class arrangements that were unique. They represented "volume for volume a much greater expenditure of work and time."[57]

One example of this kind of material consisted of works on Folklore and Manners, and customs, both closely related but difficult to classify. Both were bypassed in the original reclassification process and neither were apparently finished until 1914.[58] Another example consisted of works on American political history, the slavery issue, and Negroes in the United States. The majority of these works had been widely scattered in the old Jeffersonian scheme, especially in chapter 16 (Ethics) and in the several parts of chapter 25 (Politics). Reclassifying them was difficult because those with essentially different disciplinary orientations needed to be separated. It was also difficult because of the policy in the new scheme of placing subjects with local historical emphases under the local place throughout the historical schedule. This meant not only that they would be scattered but they had to be carefully examined on an individual basis. In the end, the reclassification of these materials was extended from 1908 to 1912 and delayed the completion of HT (Communities, Classes, and Races). They also caused a major revision of work already completed in the E-F section (American history).[59]

Another type of material to be reclassified that required considerable time and patience consisted of the form classes in the old scheme: those parts of Chapters 2-4 that contained Biography, Chapter 36 containing volumes of Letters and dialogues, Chapter 40 containing Collected works, and Chapter 41 containing volumes of Essays. In the old scheme Biography had been intermixed with other works of history and the other materials had been gathered together purely on the basis of the forms they represented. In the new scheme all such works were first classified according to their subject orientation and only then subarranged by their form. For example, biographies were placed in the subject area most closely related to the work of the biographee and then subarranged in the History cluster of that section. Collected works were placed in the subject area most closely related to their topical contents and subarranged in the General forms division cluster of that section. The only works that were placed in pure form catagories in

the new scheme were those exhibiting no particular subject bias, although even then they were sometimes placed in national literature sections. Because the scattering was extensive, each work in the older scheme had to be closely examined; and this, unlike earlier groups of materials, was very time-consuming. Their reclassification—begun in 1913—took more than two years to complete and directly affected the completion of the schedule subclasses CS (Genealogy), and CT (Collective biography).[60]

A final type of material difficult to handle was that which was written in, or dealt with, foreign languages, particularly nonwestern languages and those written in non-Latin alphabets. Most of these materials fell into the P schedule and included works on the philology and linguistics of the languages and of the literature of the language. With the exception of subclass PZ (Fiction in English), which was reclassified between 1906 and 1908, work on the majority of the P schedules began in earnest only in 1910 when Walter F. Koenig joined efforts with Martel to devise appropriate schedules for the materials.

Koenig, whose background included studies at the University of Leipzig and a Ph.D. degree from the University of Pennsylvania, had a thorough command of German, French, Latin, ancient and modern Greek, Italian, Spanish, Portuguese, and Dutch; a "cataloging knowledge" of Danish, Swedish, and Norwegian; and some familiarity with Russian, Polish, Bohemian, Serbo-Croatian, and Rumanian. As a result of his expertise, he exercised extraordinary influence over both the reclassification of these materials and the creation of schedules for them.[61]

The original plan was to place all philological materials in subclasses P-PM and the corresponding literature of the languages in PN-PZ. The arrangement of the parallel sections was to be General materials (P/PN); Classical languages and literature (PA/PP); modern European languages and literatures in the order Celtic, Romance, Germanic (including English), Slavic, etc. (PB-PH/PQ-PV); and oriental, etc. (PJ-PM/PX); with PZ (Fiction in English) placed at the end. It also seems to have been the intention to proceed through the schedule in a logical manner (if not in one sequence, then at least in two parallel sequences) and to produce a single schedule text.[62] Work began on language materials first, therefore, and although most of these were completed within the first year (1910), serious problems were encountered.

First, lack of familiarity with languages other than western European made it necessary to lay aside the philological works on some of those languages for later treatment. For the African, Arabic and Indic languages

this proved of little importance because there were relatively few materials in those areas to reclassify. It was much more of a problem for Slavic languages where materials were much more numerous.[63]

Second, the repetitious nature of the types of materials to be arranged for each of the various languages promised to make the overall enumeration of the language subclasses very lengthy. Inordinate schedule length had previously been a problem chiefly in the history schedules (D-F) where, despite similarities between the general order of topics under each country, differing time periods and other special subtopics required each country to be enumerated separately. In other places, enumeration of redundant types of patterning had been controlled by the use of special tables that could be applied here and there throughout a particular schedule. The use of such tables had generally been limited to lists of countries or, as in the case of educational materials, lists of materials by and about particular institutions. Because of the uniformity of divisions in the language area, however, the entire range of subcategories applicable to any particular language, including those found in the whole range of Martel's seven-point basic arrangement pattern, were standardized in the form of a series of tables of varying fullness that could be applied to any language. As a result, the language schedules incorporated the most thorough use of standardization in the entire scheme up to that point. Although the tables were not applied as consistently as they could have been—particular languages were sometimes enumerated in the schedule text with specific changes in the order or content of the tables—the standardization that the tables represented did constitute an important departure in the design of the system.[64]

Third, the decision to organize the works of individual literary authors alphabetically within stated time periods in the literature sections also proved to be difficult. Obscure authors, often considerable in number, had to be identified and works both by them and about them had to be organized in a logical manner. In addition, assigning integer notational sequences to individual authors was troublesome because of the need to identify all of an author's writings whether or not the Library owned them. Failure to identify all the works of an author in that kind of situation would have resulted in allocating an insufficient number of integers to that author. And that would have required in turn the reassignment of other authors' sequences at a future date. Needless to say, this process was also more difficult when classifiers were not thoroughly familiar with the literature in question.

Several solutions to these problems made the resulting literature schemes unique. Authors in any one period were enumerated in the schedules.

Although it was later claimed in the preface to the English and American literature schedules that such enumeration was meant only "to furnish an aid to classification and not to give a complete list of authors represented in these of the library's collections," nearly complete enumeration became something of a standard practice.[66] Martel also created the device of assigning a series of authors in a short alphabetical sequence to a particular integer in the notation and then subarranging them alphabetically by the second letter of their last names. This allowed the use of a full range of "Cutter" numbers after the integer rather than the limited range that was represented by the first letter of the names and that was already symbolized by the integer. The result of the device was to make the notation capable of accommodating large numbers of authors listed in any one place.[66] Finally, in order to expedite subarrangement, two basic arrangement patterns were created, one for materials related to an author in general, the other for materials related to particular works of an author. These patterns were then put forth in tables of varying fullness for application to different parts of the author enumeration according to how much notational space had been allocated to the author or work in question.

A fourth problem encountered in reclassifying the P section was the discovery that reclassifying literary materials in the logical order of the scheme was impractical. The greatest number of older materials and new accessions and those most needed in the Library's "service" were those consisting of works covering literature in general, general works (literary history and collections) in English, French, and German, and the works of particular English and American authors. In contrast, Classical literature, the logical starting point, had fewer materials and was needed less often. Reclasssification of the more numerous and needed literary materials was begun first in 1911. English and American literature were subsequently completed by 1912, French and most of German literature by 1913.[67]

A fifth and final problem encountered in completing the language and literature area was the difficulty of classifying the literature of unfamiliar foreign languages. One result of this was the need to call on a wide range of specialists, some of whom were outside the Classification Division, to help with the work. Another result was to reclassify literature in a practical rather than systematic order dictated by such factors as the availability of experts, the ease with which a schedule might be written, and the amount and importance to the Library's circulation of the materials to be reclassified. In this respect, Scandinavian literatures were delayed until 1916-17 after some of the Slavic literatures had been completed. Classical literature, which was to have been worked on first, did not have a schedule made until

1917 and its reclassification was not completed until about 1920. And some materials, notably Russian and Hebrew literature, were not completed at all during this era.[68] The last two problems eventually contributed to a change in the order of the P schedule. Only major literatures were placed in PN to PZ. Others, worked on simultaneously with their language materials, were placed with the latter in P to PM.

New Schedules, 1912-30

The three characteristics of the second era had a distinct effect on efforts to produce additional new schedules for the system. Although the remainder of the original set of schedules (i.e., all but P, BL-BX, and K) were completed and published by 1916 (see fig. 7), that task was not accomplished without difficulty. The remaining parts of the G and H schedules as well as the C schedule were published in 1915. The first two, though small, were more than four years in preparation and were eventually published separately as pamphlets. Schedule C was delayed because of the lengthy reclassification of biography. When issued, it lacked subclass CN (Epigraphy) which could not be completed because of its relationship to the delayed classical literature schedule. Schedule D, one of the first areas to be reclassified, was not published until 1916 because extensive revisions in the text were needed to reconcile differences caused by it having been done "at different times and by different people...."[69]

The schedules for Language and literature and for Religion took even longer. In order not to delay what had already been completed, subclasses PN, PR, PS, and PZ were issued together as a separate publication in 1915, four years after the reclassification of those materials was completed. But that was the only portion of the P section to be treated with dispatch. In 1920 Clarence Perley suggested the possibility of issuing the remainder as quickly as possible "as manuscript"—i.e., without serious editing. However, Walter Koenig, the overseer and principal creator of the P schedule, was too conscientious a scholar to allow that to happen. Instead, he directed his energies to edit meticulously the schedule beginning with subclasses P and PA. The product of his labor eventually elicited praise from both Perley and Hanson. Its scholarly character represented an opportunity to offset criticisms of the pragmatic character of the scheme in general. But Koenig's approach took an inordinate amount of time, a matter exacerbated by the press of the regular work of the division. Furthermore, when the P-PA portion was finally sent to the government printing office in 1924, funding for the Library was at a low ebb and printing of new schedules was set aside. The P-PA schedule ultimately remained "in press"

until its publication at the end of 1928. It was eventually to be the only other portion of the P schedule published in this period. Publication of the Religion schedule (BL-BX) also suffered from the same shortage of funds, its delay extending from 1921 when it was completed to 1927 when it was published.[70]

Additions and Changes, 1912-30

Another major influence on the scheme was the need to make additions and changes to those schedules that had already been published. Additions and a reasonable number of changes could be expected with the normal growth of the library's collections. But the fact that some of the schedules had been published before much of the reclassification project had been finished and others had been rushed through the press before their arrangement was completed made the problem critical. In some cases, important categories of materials had to be omitted. In other cases, new materials required substantial revisions in schedule arrangements.[71] The latter was particularly the case when difficult materials bypassed earlier in the project were reclassified and when special acquisitions involving thousands of volumes such as the Toner collection of Americana and the Yudin collection of Russian language materials were classified.

The need to make extensive additions and changes might have been handled as an internal matter had the earliest relationship of the scheme to the larger community of libraries remained unchanged, that is, as a general reference source for classification information. By 1916, however, at least 43 other libraries were actually using the scheme to arrange their own collections. By 1930 that total had reached 131 libraries (including 19 in foreign countries), most of which served a scholarly clientele.[72]

The use of the scheme by a growing number of other libraries meant that information about additions and changes was critical and that a way of disseminating it had to be found. The Library's first response to that need was to reissue previously published schedules in new editions with additions and changes integrated in their texts. The first such revision was the Z schedule published in a second edition in 1910. Thereafter, the Library concentrated on reissuing all of the schedules that had originally been published by 1911. By 1929 all except B-BJ (philosophy) and V (naval science) had been republished in second and even third editions (see fig.7).

In many cases, the additions and changes incorporated into the new editions were no greater in number or significance than might be expected

from the normal growth of a pragmatic classification system. Other changes resulted from continued reclassification and recataloging. In some of the latter instances the revisions were substantial in number or scope. For example, a second edition of schedule A in 1915 incorporated changes made when the form classes of the old scheme were reclassified. The second edition of schedule E-F in 1918 incorporated expansions related to the reclassification of works on American political history and extensive reference notes. Other new editions represented substantial revisions of terminology (H) or categories (J and R). Still others included large numbers of new material such as the greatly expanded index in schedule S. Two second editions also incorporated sections of schedules that had been issued separately at first: H (1920) included HT, and G (1928) included GR-GT. And issuing D501-659 covering World War I (1921) took the form of a pattern followed earlier with HT and GR-GT—the separate publication of an addendum to an already published schedule. Schedule D had originally been published in 1916. Because the part covering the World War was a cohesive section rather than a series of categories scattered throughout the schedule text and because schedule D was not only large in size but still available, publishing D501-659 separately was an expedient move designated to save money and time.

Disseminating information on additions and changes in this way was a notable service to users of the scheme especially since revisions were integrated into the texts. But ultimately the method proved to have serious drawbacks. For one thing, even under the best of circumstances a new edition would only be issued years after many of the initial revisions had actually been made. A delay of this kind was partly due to the amount of labor required to prepare a revision and partly due to the need to allow the stock of a previous edition to become depleted before a new edition was issued. Another difficulty with this method was that the amount of time required to prepare the new editions removed staff from the reclassification project and from the preparation of other schedules not yet issued. Some idea of the activity of reissuing older schedules may be seen in figure 9 where new publications and reissues are compared chronologically. The most critical period was from 1921 to 1929 when ten new editions (including three third editions) and the supplement to schedule D were issued while the publication of a completed P schedule and the reclassification of and preparation of a schedule for religious materials languished. Of course, some of the delay in publishing the P schedule was due to Koenig's slow progress in editing the text and to serious shortages of funds. Still, even when funds and time were available, priority was given to the publication of revised editions. In 1924 a second edition of J (Political science)

was produced and P-PA allowed to remain "in press," while in 1928 three second editions (G, S and U) were issued ahead of P-PA.

Figure 9

New Schedules	New Editions	New Schedules	New Editions
1912	Q_2	1921	D Suppl., Q_3,R_2
1913	E-F_2	1922	N_3,T_2
1914		1923	
1915 C, CR-CT, HT, PN/PR/PS/PZ	A_2	1924	J_2
1916 D		1925	
1917	M_2,N_2	1926	
1918		1927 BL-BX	Z_3
1919		1928 P-PA	G_2,S_2,U_2
1920	H_2	1929	L_2

Fig. 9. New Schedules Compared to New Editions, 1912-1929 (Chronological)

The fact that an increase in publishing new editions of older schedules occurred by the end of the 1920s did not obviate the drawbacks to this method of dissemination. In fact, a combination of significant increases in new accessions beginning in 1926, persistent shortages of classification personnel, and the gradual shift in focus of the Library's activities to a broader range of nontechnical programs ultimately made this procedure as difficult to accomplish as that of finishing the incomplete P schedule. As a result, a less expensive and time-consuming approach to the task was finally devised—the publication of additions and changes in a form separate from the schedules themselves and issued in a reasonably regular manner. When Clarence W. Perley first mentioned this possibility in 1926, he proposed that they be issued in the form of a list much like the supplement to the subject heading list. When the first issue of additions and changes did come out in 1928, however, it took two different forms: the first on printed cards much in the same ways that descriptive cataloging rule changes were issued; the second on gummed slips that could be placed in the appropriate places in the schedule volumes.[73]

In many respects, attempts to create a more efficient approach to the dissemination of information about additions and changes was a positive attempt to adjust to rapidly changing general conditions in the Library. Those more general changes were so striking that one may conclude they represented the end of an era both in the life of the Library and in the development of the Library's classification scheme. The latter was no longer the "new" system it had once been. Moreover, the reclassification project upon which its development was based had, with few exceptions, finally become only a relatively minor part of the Library's processing work. As if to emphasize the change taking place, both Charles Martel and Walter F. Koenig retired in 1930. Their retirements symbolized a cutting of ties with the past and the ushering in of still another era in the development of the system.[74]

CLASSIFICATION DEVELOPMENT: 1930-46—AN INTERLUDE

The third era in the development of the present classification system of the Library of Congress coincided with the last years of Herbert Putnam (1930-39), the term of Archibald MacLeish (1939-44) and the first two years of MacLeish's successor, Luther H. Evans (1944-46), as chief administrators of the Library. This period served as an interlude in the development of the scheme because general conditions in the Library made possible only minimal and intermittent progress on the system. At the same time, the period was important because it witnessed a broadening of the scope of the Library and an administrative reorganization that made the broadened scope viable. The effect of these changes on the classification system laid the foundation for it to attain national and even international influence.

The Last Years of the Putnam Era: 1930-39

The broadening of the focus of the Library of Congress that began by the end of World War I came about through the leadership of Herbert Putman. By that time and throughout the remaining years of his tenure, Putnam's earlier concern for library technical matters and their dissemination to the wider library community came to be "overshadowed by his concern with the 'interpretation' of the [Library's] collections," in which the Library's role as a center of cultural and scholarly activity was stressed.[75]

The Library's cultural activities helped to expand its overall mission and enhanced its "national" character. As the decade of the 1930s progressed, however, the Library increasingly found itself ill-equipped to handle

them. There had been no administrative reorganization of the Library since 1902 so that by the 1930s the many new units created to accomplish particular tasks often overlapped in functions and duties. Files necessary to accomplish tasks were often duplicated by various library units and lines of work flow and communication became blurred. Putnam's autocratic, administrative style also allowed no middle managerial structure so that by the time he retired in 1939 all 35 major internal units of the Library reported to him separately and directly. In that administrative context, planning was at a minimum with little assessment of the impact of one department's special projects on the work flow of others and with almost no use of statistics for assessing work force needs and costs. A threefold increase in new accessions during the 1930s severely aggravated the general situation and, given the lack of an efficient organizational structure, resulted by 1940 in more than 1.5 million unprocessed items. In sum, the 1930s saw the internal organization of the Library reach a serious crisis.[76]

Work on the classification scheme suffered equally with work in other technical areas of the Library. A lack of creative administrative leadership and discipline seems to have been particularly a problem among the Library's technical departments, including the Classification Division.[77] That Division attempted to keep up with the dramatic rise in new accessions but with no significant increases in personnel. Classification work was further hindered by responsibilities that went beyond regular classification and shelflisting. These included book preparation, changing classification symbols in the public catalog, and assisting the reference department in locating books. Special projects also siphoned off much time and energy. Among these were the involvement in the reorganization of the rare book room and assisting in an inventory of the reading rooms (both begun in 1930), a special classification effort related to the newly created Aeronautical Division (beginning in 1931), creation of a union binding record (beginning in 1933), processing a special group of 10,000 pamphlet-bound documents (1935), involvement in the selection of books in Spanish and Portuguese (1936), and the merging of the sheet and card shelflisting records (beginning in 1938). Reclassification as a project also re-emerged in the midst of this ever more exasperating work load when some 5000 additional books on religion were processed during 1934-35.[78]

Given this situation, it is surprising that any work at all was accomplished on the classification scheme. The publication of *Library of Congress Classification: Additions and Changes* relieved most of the pressure to reissue earlier schedules, especially since additions and changes were relatively few in number. The only exceptions to this practice were a second

edition of the World War I supplement to schedule D, expanded from D501-659 to D501-725 (1933), and a third edition of T made necessary by the classification of aeronautical materials (1937).[79] Through the special efforts of Clarence W. Perley, several new literature schedules were also published for the first time (see fig. 10). The first, PB-PH, had actually been received in proof when Walter H. Koenig retired in 1930. Perley finally managed to get it through the press in 1933. Thereafter, in quick succession and perhaps as a result of being freed from Koenig's meticulous but slow editorial work, Perley was able to complete PJ-PM (1935), a special pamphlet of additions and changes to PJ-PM, and Index to Languages in P-PM (1936), and three of four remaining major literature schedules (PQ, parts 1 and 2, and PT, part 1), the latter published the year following his retirement. By 1937 he also completed epigraphy (CN), which had been omitted from the original C schedule in 1915, and PT, part 2. But neither of these were published for another five years.

Years of Change, 1940-46

The need to decisively reorganize the Library and reduce its processing backlog made this period even less fruitful for classification development. Archibald MacLeish's reorganization efforts began in mid-1940 with a special committee commissioned to study the institution's processing operations. The most important result of the committee's recommendations on classification work was to combine it with subject heading work in a new Subject Cataloging Division and to remove from the new division all responsibilities not essentially related to subject analysis and organization.[80]

The first chief of the Subject Cataloging Division, David J. Haykin, also brought a new outlook and vigor to the unit. Almost immediately the annual reports issued from the division spoke enthusiastically of long-range plans related to subject access needs. These included drawing up a law schedule, writing manuals for subject cataloging and classification, and engaging in greater revision of the subject heading and classification systems. The latter two concerns were particularly important because behind them was Haykin's appreciation of the growth and changing nature of special fields of knowledge and the necessity of employing specialists for subject access work.[81]

Unfortunately, little could be done immediately to implement such goals. With the nation at war, little support could be devoted to new efforts. Furthermore, increases in personnel that came with the Library's reorganization had to be assigned to such pressing needs as the classification of

Figure 10

Latest Ed. in 1930	Revised Editions	Reprints	New Schedules/Supplements
A_2			
$B-BJ_1$		(1944)	
$BL-BX_1$			
C_1 (w/out CN)			
			CN (1942)
D_1		(1946)	
$D501-659_1$ (WWI)	$D501-725_2$ (1933)		
$E-F_2$		(1946)	
G_2 (w/out maps,etc)			
			G3160-9999 (Maps,etc.) (1946) (tentative)
H_2		(1944)	
J_2		(1944)	
L_2			
M_2		(1943)	
M_3		(1943)	
$P-PA_1$			
			PA Supplement (1942)
			PB-PH (1933)
			PJ-PM (1935)
			P-PM Index to Lgs. (1936)
PN,PR,PS,PZ_1		(1946)	
			PQ-I (1936)
			PQ-II (1937)
			PT-I (1938)
			PT-II (1942)
Q_1		(1943)	
R_2		(1946)	
S_2			
T_2	T_3 (1937)		
U_2			
V_1		(1946)	
Z_3		(1946)	

Fig. 10. LC Classification Revised Editions, Reprints, & New Schedules, 1931-1946

current acquisitions, the processing backlog, and the shelflist conversion project begun in 1938. In fact, Haykin was quick to note that, despite the value of the plans he proposed, they were, at least for the time being, "incidental to the daily work of the subject catalogers."[88]

Even with these restrictions some work on the classification scheme was accomplished. The additions and changes bulletin began to be published on a quarterly basis in 1941.[89] Two schedules PT, part 2 and CN (Epi-

graphy), prepared for printing in 1937, were published in 1942, as well as a supplement to PA (see fig. 10). A tentative schedule for Russian literature was also developed by 1942 although the task of preparing it for printing had to be set aside. During 1943, 1944 and 1946 the division also tried an alternative to the full reediting of earlier schedules by simply reprinting twelve earlier volumes without changes. Finally, despite the work load, the division participated in two new classification ventures: preliminary discussions on a classification scheme for the Army Medical Library (1944) and the publication in mimeographed form of a tentative schedule for maps and atlases in the G schedule (1946).[84]

With the end of the war and with additional changes made by Luther H. Evans during 1945 and 1946, the Library of Congress found itself poised for entry into a new age. The most significant accomplishment of the six years between 1940 and 1946 was to supply the Library with an organizational structure that was consonant with its expanded mission. With the appointment of divisional leaders who, like David J. Haykin, had a strong grasp of the leadership the Library might assume, all that was needed was to begin. That beginning occurred by 1947 both for the Library as a whole and for the classification scheme as a new round of planning, proposals and activities were pursued.[85]

CLASSIFICATION DEVELOPMENT: 1947—PRESENT

Earlier in the century, the idea that the classification system had a national role grew very slowly. The principal classification activity of the Library was to create the scheme. Publishing it in preliminary and, if possible, more refined editions for those who might possibly use it, was pursued but not always as a first priority. During the most recent era, the national role of the classification system has, in contrast, been instrumental in the development of the scheme. Creating the scheme has continued, but keeping it up-to-date and readily available for the wider library community have become important because there has been a significant increase in the number of other libraries adopting it, as well as a large rise in the number of additions to and changes in the system. Additions and changes have become so striking, in fact, that they have led to the virtual recreating of some parts of the scheme. As a corollary to keeping the scheme up-to-date and readily available, the Library has significantly increased its efforts to discuss with the wider library community the nature and use of the system.

1947-54

When activity on the Library's classification scheme was resumed in 1947, one of the first priorities was to finish sections of it that had previously been delayed. However, only one of these, a scheme for classifying Russian literature (PG 2900-3560), was completed with any dispatch. It was sent to the printer and published during the 1947-48 fiscal year. Because it was very extensive, it was published separately from the regular PB-PH schedule and entitled *Class P, Subclass PG* (in part).[86]

Calls for a schedule for legal materials (class K), planned for in the original outline of the scheme but apparently dropped from active consideration by 1912, were renewed in 1933 and again in 1941 and 1942.[87] During 1947 and 1948 the use of the Law Library of the Library of Congress increased so much and backlogs in its processing became so notable that the Library took its first steps to develop a schedule. First, an alternative K schedule devised by Elizabeth Benyon for the University of Chicago law library was published in 1948 by the Library of Congress and circulated to law libraries and specialists for review. Second, a committee on a law classification was appointed within the Library. Its interim report both defined the limits of the proposed schedule and prepared a tentative outline. Third, the report of the committee was submitted to the Association of American Law Libraries for discussion at its 1949 annual conference.

These actions marked a significant departure in classification development at the Library because, for the first time, the opinions of those outside the Library were not only actively sought before devising a schedule, but were also allowed to influence the final result. It was not until 1952, however, that a staff member of the Library, Werner B. Ellinger, the chief classifier of law materials, was freed from other duties to work directly on the project. His approach to the work was to prepare working papers, "intended as complete and theoretical mappings of the domain of each of the major areas of the schedule, that is, the particular legal systems and jurisdictions."[88] The study papers were deemed necessary because of the diverse ways in which legal systems and their literatures were organized. The preparation of the papers ultimately took until the end of the 1950s and the actual application of a scheme was not begun until the 1960s.

Two other areas of concern—an index to the entire scheme and a revised medical scheme—also met with delay and disappointment. The need for an index to the entire classification had long been expressed but had not been worked on mainly because it had been viewed as a project to be undertaken after the entire scheme had been published. In the place of a

comprehensive index, most of the individual schedules had their own indexes. In 1947 the Library began an index project by merging the clipped entries of individual indexes. But this project came to a halt when work on the law schedule began, most likely because the new schedule held the potential for displacing a large number of materials previously classified in other parts of the syetem under the fifth category in Martel's basic arrangement pattern.[89]

As for medicine, when the Library joined with the Army Medical Library in 1944 in developing a classification scheme for that Library, the work held some promise of replacing schedule R as a classification for medicine. It was subsequently allocated the notational sumbol W, unused up to that time in the Library's own system. By the time the new schedule was published in a tentative form in 1948, however, its content and structure made using it in the regular system impossible. Therefore, the Library took steps beginning in 1947 to revise its own R schedule for medicine, a task that eventually took until 1952.[90]

A second area of concern that the Library began to address in a significant way beginning in 1947-48 was keeping the scheme up-to-date. In 1942, Haykin had stated in his first report as chief of the Subject Cataloging Division that it was necessary for both the subject heading system and the classification to change as the subjects they dealt with changed. Seven years later his statement that, "it is necessary constantly to rebuild parts of a weakened classification structure and to bolster others" suggested that the changes he had in mind were considerably more extensive than cosmetic alterations. Because the organization of knowledge became obsolete as new knowledge was discovered, it would be necess. to virtually recreate sections of the scheme.[91]

This approach to change in the scheme was notably different from what had transpired in previous decades. Earlier schedule revisions had been made to clarify the initial structure of the system. A period of intensive schedule revision and publication had ensued after 1911, but it ended in 1928-29 when the publication of additions and changes had been relegated to a serial bulletin. During the 1930s the bulletin was sufficient as a vehicle to convey additions and changes chiefly because relatively few of them had been made. Beginning in the 1940s the number of additions and changes began to rise steadily. By the period 1947-49, additions alone had reached more than 425 a year and changes to well over 100. From 1950 to 1954, their numbers were above 750 and 200 respectively.[92] The Library's response to this shift in emphasis was to return to a previous publication strategy: the publication of revised editions of schedules. During the eight years from

1947 to 1954, thirteen wholly revised schedules and a new supplement to D (WWII) were issued in this way (see fig. 11). By 1949 the Library was able to follow this stratedy because of the development of a new method of schedule revision. Printed additions and changes were clipped and inserted into printed copy of the older schedules with the result photographed for offset reproduction. This method seems to have inspired a great deal of confidence so that by 1952 a goal was made of revising "all schedules that have not been published in revised editions since 1940."[93]

Even with the simplified process, however, the revision of some of the earlier schedules remained a difficult and time-consuming task.Of ten schedules entered into the revision process during 1947 and 1948, three (G, L and R) eventually took three to six years to complete. And of these, work on the R schedule followed the same pattern exercised with the Army Medical Library classification (schedule W) and the new law scheme by being submitted to experts for review and criticism. In addition, the Q schedule, issued in a fourth edition in 1948, was quickly reissued in a fifth edition in 1950 in order to incorporate important changes related to nuclear science.[94]

The reality of revision—that it was unavoidably difficult and time-consuming in at least some cases—made it obvious that many years would pass before all schedules could be revised. In order to maintain their availability, the Library adopted the concurrent policy in 1951 of maintaining all schedules in print even if there was little hope for their early revision. This meant that, when needed, they were simply to be reprinted in their latest editions. Some reprinting of schedules in significant numbers had occurred in the previous era during 1943, 1944 and 1946. The 1951 decision resulted in ten more reprints that year, six in 1953, and three more in 1954 (see fig. 11).[95]

1954-Present

Since 1954 two other changes occurred that caused the Library once again to shift the way work was done on the scheme. First, the number of additions made to the scheme again rose significantly, averaging more than 950 annually between 1955 and 1960, 1700 between 1961 and 1967, and over 3400 annually thereafter. Increases in additions and changes were due to the development of previously underdeveloped or only partially developed areas of the scheme. Some of that development came from revising older subject areas. For example, the long-delayed schedule for Hebrew literature was developed and applied in 1955 in place of class numbers

Figure 11

Latest Edition in 1946	Revised Editions 1947-1954	Reprints 1951-1954	Revised Ed'ns 1955-1968	Reprints "With Supplementary Pages," 1955-1968
A_2	A_3 (1947)	('53)		('63)
B-BJ_1	B-BJ_2 (1950)	('51)		('60) ('68)
BL-BX_1		*('51-'53-'54)	BL-BX_2 (1963)	
C_1 (w/out CN)	C_2 (1948)	('53)		('61) ('67)
CN_1				
D_1		('51)	D_2 (1959)	('64)
DS01-725(MVI)$_2$		§('54)		
	DS731-824$_1$ (1947) (MVI)	('53)		
B-F_2		('53)	B-F_3 (1958)	('65)
G_2	G_3 (1954)			('66)
G3160-9999 (Maps,etc)				
H_2	H_3 (1950)	('51)		('59) ('65)
J_2		('51)		('58) ('61) ('66)
L_2	L_3 (1951)			('60) ('66)
M_2		('51)		('57) ('63) ('68)
N_1		('51)		('55) ('62)
P-PA_1				('55) ('64) ('68)
PA Suppl.$_1$				('56) ('64) ('68)
PB-PH_1		('51)		('57) ('66)
	PG(in part)$_1$(1948)			('55) ('65)
PJ-PN_1				('58) ('65)
P-PN Index to Lang'e$_1$			P-PN Index to Lang'e$_2$ (1957)	('65)
PN,PR,PS,PZ$_1$		('51)		('56) ('64)
PQ-I_1				('57) ('66)
PQ-II_1				('55) ('65)
PT-I_1				('57) ('66)
PT-II_1				('55) ('65)
Q_3	Q_4(1948) Q_5(1950)	('54)		('57) ('63) ('67)
R_2	R_3 (1952)	('54)		('60) ('66)
S_2	S_3 (1948)	§('54)		('59) ('65)
T_3	T_4 (1948)	('53)		**('64-'65)
U_2	U_3 (1952)			('60) ('66)
V_1	V_2 (1953)			('66)
Z_3		('51) ('54)	Z_4 (1959)	('65)

* Reprint publication records seem inaccurate.
§ Reprinted "with supplementary pages" late in 1954.
** Schedule reprinted in 1964. Supplementary pages printed separately in 1965.

Fig. 11. LC Classification New Schedules, Revised Editions, Reprints, and Reprints "With Supplementary Pages," 1947-1968

previously set aside for "post-Biblical Hebrew" (PJ 5001-5060). Other schedule developments were caused by a rise in foreign acquisitions made possible by Public Law 480 and the National Program for Acquisitions and cataloging (NPAC). For example, between 1961 and 1965, the sections for Japanese, Korean and Chinese literature (PL 700-889, 950-988 and

2250-3208) were decisively revised. In 1966, major revisions were also made in engineering, construction, marine biology, and modern Eastern European philosophy. And in 1972 a revision of the religion schedule for Buddhism resulted in an entirely new schedule subclass (BQ) published in the additions and changes bulletin.

Second, the number of other libraries adopting the Library's classification scheme rose dramatically. By the end of the first three decades of the twentieth century, 131 other libraries had begun to use the system in whole or in part. And after still another decade that total had risen to 209.[96] By 1964, however, Richard S. Angell, then chief of the Subject Cataloging Division, estimated that the total had increased to between 800 and 1000 libraries. And by the early 1980s, the total has apparently topped 1400 including close to 200 libraries in other countries. Even without an accurate count it is evident that there has been a noticeable move, especially over the last three decades, to adopt the system although a 1975 study suggested that its adoption by academic libraries has slowed since 1968.[97]

Much of the increased use of the scheme has been due to libraries being reclassified from the Dewey Decimal Classification to the Library of Congress system. Maurice J. Tauber pointed out that this had begun among academic libraries during earlier decades.[98] More recently, and especially during the early 1960s, the movement to adopt the system has included other types of libraries as well. A considerable literature from the 1960s documents the movement and provides occasional discussions of the features of the Library of Congress system. One reason for libraries to shift to the Library of Congress system has been the opinion that it provides better coverage of the literature to be classified. This reason has sometimes been combined with publicly expressed dissatisfaction with the Dewey Decimal Classification during the period of its transitional fifteenth through seventeenth editions (1951-71). That this can only be a partial explanation is suggested by the fact that the Library of Congress Classification has not itself escaped strong criticism over both its general philososphy and its coverage of particular subject areas.

A more likely explanation of the increase in use had to do with economic factors. These were well-summarized by Raimund E. Matthis and Desmond Taylor in 1971:

> "The primary reason for adopting LC is economy-" resulting from keying into the world's most extensive library operation....While it is impossible to give an exact, overall dollars and cents savings for libraries throughout the country, it is possible for each library to assess its own cataloging costs in terms of its salary and wage scales and come up with

> some rather startling figures. If one examines library literature on cataloging costs, little doubt remains that substantial savings are associated with the adoption of the Library of Congress Classification system.[99]

Matthis and Taylor identified this savings with the growth of centralized cataloging and classification and with the more thorough ready-to-use classification copy for the Library of Congress system that centralization had been able to supply. In other words, *Library of Congress Classification* copy had always been more complete because it supplied both class *and* shelflisting numbers. And it had provided broader coverage of new publications from a single standardized source. Better classification copy was the result of large increases in the Library's acquisitions, the necessity that the Library keep up with the classification of that increased volume of acquisitions, and the practice of the Library constantly to modify its system to accommodate new subjects. In contrast, *Dewey Decimal Classification* copy issued from the Library's Decimal Classification Division had not begun until the 1930s, had never included the shelflisting element of call numbers (i.e., Cutter numbers), and until the mid-1960s, was supplied for a smaller number of the new items acquired.

One might be tempted to extend this economic analysis by supposing that a decade of growth in catalog automation through the MARC program and bibliographic networks would have increased the rate of adoption of the Library of Congress system even further. But this corollary has not held. The growth of such networks, combined with the increased attention that the Library of Congress itself has paid to its *Decimal Classification* work, had improved the dissemination of *Decimal Classification* copy as well.[100] As a result, using the Decimal system has itself become more economical. This fact, combined with the enormous cost that reclassification has involved in many instances, has apparently slowed the rate of the shift from one system to the other.

One consequence of the rise in the number of users of the Library's classification system has been to place even more pressure on the Library to keep the system up-to-date, to maintain the availability of its schedules, and to disseminate information on additions and changes in a timely manner. Furthermore, the absence of manuals or other comprehensive explanations of the scheme has raised the need for greater interaction between the Library and users of the system in order to explain how it functions and changes.

The Library's response to these factors may be viewed in various ways. First the nature of enumeration in the system has changed even further from its original patterns. Martel's basic arrangement pattern, the key to the

scheme's enumerative structure, had originally been developed in the earliest schedules, notably in Q (1905) and those published in 1910-11. Some movement away from the pattern had occurred in the language and literature schedules where they required special categories in the first six clusters of the pattern.

Beginning in the 1950s, however, the pattern has become obscured. This has occurred because of the need to insert hundreds of new additions and changes into the scheme. In some schedules new categories such as "Communication of information," and "[The field in question] as a profession," inserted into the preliminary six clusters of general materials, have tended to float in position from schedule to schedule rather than being assigned to a specific cluster. In other instances the enumeration of general materials has become so detailed that the sense of the original patterns has become lost. The latter has been further aggravated since 1970 by the new publishing format in which captions for clusters and indentions to show subordination have been deleted in many places. The growth in enumerative detail is particularly noticeable in the new law schedules. Close examination will show that the framework of Martel's original seven-point arrangement pattern has survived. But it is greatly obscured because of the many special legal material categories that have been added to the first six clusters. Finally, the positioning of new fields of study has varied. In some cases a previous schedule section has been expanded and even moved with little disruption because space was available in a previously established order. For example, the schedule for literature on Buddhism (previously BL 1400-1499) was expanded and moved to a new location (BQ), this in keeping with the previous practice of providing special subclass locations for major religions. In other cases insertion of new fields of study into an available location appears to have occurred on the basis of only a general association of the new with an older field. For example, computer science has been placed in QA 75-76. But this only is a subcategory location (calculating machines) among the general materials clusters of the mathematics class. Further there are other materials central to that discipline that are located elsewhere. It is obvious that there are affinities between Computer Science and mathematics and, within the latter, calculating machines. One would have thought, however, that a more systematically devised location might have been found for what is now a major discipline. The result of decisions such as this has been to make the scheme even more pragmatic in its organization than it was when it was first developed.

A second response to the new classification situation has been changing strategies in the dissemination of information on additions and changes. Beginning late in 1954, the photolithographic method of producing new

editions was confined to additions and changes alone. That is, additions and changes were cumulated, integrated and published by themselves as sections of supplementary pages at the back of reprints of the most recent editions of particular schedules. Although this strategy did not produce revised schedules, it did dispense with the need for users of the scheme to look in several issues of the additions and changes bulletin to find the additions and changes that pertained to a particular schedule. Further, because an entire schedule text was not being revised, the procedure could be done more often. That this was a heavily used medium of publication is evident in the fact that 57 reprints "with supplementary pages" were issued between 1954 and 1968 (see fig. 11), some schedules as many as three times. The heaviest single concentration of them occurred in 1965 and 1966 when 20 separate schedules were reissued. As a corollary to this strategy, the number of wholly revised schedules published in the form of new editions decreased drastically. A total of only five (BL-BX, D, E-F, Z and the P-PM Index to Languages) were released during the entire period and all of those by 1962 (see fig. 11).

This publishing strategy was not without difficulties. By the end of this period, additions and changes had increased so much that many of the schedules were becoming difficult to use, having almost as many, and sometimes even more, pages in the supplementary sections as in the original. In 1970, therefore, the Library once again shifted its strategy. First, it ceased to cumulate additions and changes for supplementary schedule sections. This decision was made possible by the beginning of the ongoing publication of cumulated additions and changes in an independent publication released by the Gale Research Company beginning in 1971.[101] Second, beginning with the fourth edition of N (fine arts) in 1970, the Library's own production of revised schedule editions was again resumed. Since that date it has amounted to a notable achievement including no less than 16 schedules, one of those, H (1980-1981), itself issued in two volumes because of its growth in size since a third edition in 1950 (see fig. 12). The format of the new editions has also changed in that schedules are no longer typeset but rather photolithed from typescript and printed on only the recto side of each leaf. This allows both more efficient production as well as ample space for classifiers to insert additions and changes in the text as they appear in the additions and changes bulletin.[102]

A third response of the Library to changing conditions related to classification was to expedite the development of a law classification schedule and to begin actual reclassification of legal materials.[103] The Library's plan to develop working papers on major legal systems and to submit them to experts for criticism was a sound procedure, but it greatly extended the

Figure 12

New Schedules	New Editions
	A_4 (1974)
	B-BJ_3 (1979)
BQ_1 (1972)	
	C_3 (1975)
	G_4 (1976)
	H-HJ_4 (1981)
	HM-HX_4 (1980)
K(subclass)$_1$ (1977)	
KD_1 (1973)	
KE_1 (1977)	
KF_1 (1969)	
KK_1 (1983)	
	M_3 (1978)
	N_4 (1970)
	P-PM Index to Languages$_3$ (1983)
	PN,PR,PS,PZ_2 (1978)
P-PM Lang. & Lit. Tables$_1$ (1982)	
	Q_6 (1973)
	R_4 (1980)
	S_4 (1983)
	T_5 (1971)
	U_4 (1974)
	V_3 (1974)
	Z_5 (1980)

Fig. 12. LC Classification New Schedules and New Editions, 1969 to Present

actual process. The eight papers composed between 1953 and 1958 provided a strong basis for developing a scheme and also the opportunity for testing some parts of it. But by that date there was still no systematic plan to reclassify the actual collections, then numbering well over 1 million volumes. Pressure from the American Association of Law Libraries to complete a scheme not only increased but led some to suggest that the AALL develop its own scheme. The impasse was finally broken in 1958 when the Council on Library Resources provided funds to convene an Advisory Committee on the Classification of Anglo-American Law that would assist the Library's staff. The committee helped to spur the develop-

ment of drafts of an American law schedule between 1959 and 1962. Thereafter, a second grant awarded in 1962 implemented the actual reclassification process. This included duplicating the law shelflist in order to test the new scheme in surrogate form and completing a draft schedule for law of the United States (KF). In March 1966 the first KF classification numbers began to appear on Library of Congress printed cards. The task has eventually proven to be very large since it has involved not only more than 1 million items in the Law Library itself, but also more than 200,000 volumes transferred to the law section from other parts of the classification scheme. The KF schedule was eventually published in 1969 as the first of what has since become a large number of separate schedules (see fig. 12). In addition, since the Library did not plan to reprint older cards of law books now reclassified, arrangements were made to supply libraries with microfilm copies of the Library's growing K schedule shelflist.

A final response of the Library to the changing classification situation was to set up more efficient lines of communication between the Library and users of the classification scheme. This has taken several forms. The Library has cooperated as much as possible in making auxiliary classification products available. They have not only the Gale publication of cumulated additions and changes already mentioned but also an unofficial index to the schedules and a microfiche copy of its shelflist.[104]

The Library has also elicited the help and criticism of persons outside the Library in the creation or revision of the scheme, a matter already noted with respect to the revised R (medicine) schedule and the new K (law) schedules, but also in the revision of the N (fine arts) schedule and, at least in part, in the creation of the new BQ (Buddhism) subclass.[105] And, beginning with the Haykin period, the subject cataloging staff of the Library has participated actively in public discussion regarding the classification system. This has included making significant major addresses at important public meetings and participating in ALA committee work. In 1966 it led to the "Institute on the Use of the Library of Congress Classification," the most notable official attempt at explaining the nature of the system.[106] More recently, the attempt to improve lines of communication has led the Library to make its Cataloging Service Bulletin a major vehicle of policy dissemination.[107] It has also established a CIP (cataloging in person) program in which a suite has been set aside at ALA conferences where some of the Library's staff are available for consultation with librarians on all aspects of the Library's bibliographic work including its classification.

Last, the effort to improve lines of communication has also changed classification procedure and policy itself at least in some instances. For example, as a result of opinion expressed at the 1966 institute, the Library began in 1968 to print two classification numbers on many of the printed cards for literary works—one in PZ1, 3 or 4, the class number used by the Library; the other in the regular literature schedules for those libraries that did not use the PZ numbers.[108] The Library has also used the Cataloging Service Bulletin to elicit comments from classifiers on policy considerations.

CONCLUSION

Classification at the Library of Congress has obviously undergone significant developments in 180 years. Shelf classification at the Library has changed from an earlier nineteenth-century system that was expressive of the limitation of an early period in classification work in general and that was developed at best in only an *ad hoc* and highly pragmatic manner, to one that represents a concerted effort to encompass a rapidly expanding universe of special subject areas. The newer scheme has been affected by some of the characteristics of the Library's classification past, including a propensity for simple arrangement patterns (especially alphabetical order) and a pragmatic approach to the collocation of subjects. At the time of its creation, however, it represented something of a state-of-the-art advance in classification especially in view of the general consensus of that time that sheer enumeration of subjects was at the core of a successful and usable classification scheme.

Since 1910, when the newer scheme became firmly established, various factors have caused its enumeration patterns to continue to change. One obvious shift has been a greater use of synthesis in the scheme, a matter notable in the use of special tables in the language and literature schedules developed after 1910 and especially in the law schedules developed since the 1950s. Although the use of synthesis has been simple rather than complex, and it has been used chiefly at the shelflisting level rather than in subject subdivision, it represents a phenomenon that is common to twentieth-century classification thought. A second change has been the gradual loss of the clarity of Martel's basic arrangement pattern chiefly as a result of the addition of new categories within the first six points of that pattern without close regard for the integrity of the original clusters. A third change has been the increasing complexity of the schedules due to the

incorporation of thousands of additions and changes since the 1950s, many of them representing entirely new subject fields. Many of the additions have been inserted in the scheme chiefly on the basis of their general association with other subjects and the fact that notational space was available rather than overreaching systematic considerations. This practice, when combined with the loss of the integrity of the basic arrangement pattern clusters, has had the effect of making the scheme less and less orderly in its internal structure.

Classification at the Library of Congress has also undergone an obvious change in its relationship to the wider library community, not only in the United States but throughout the world. During the nineteenth century the Library's classification work was an internal matter for the Library of Congress alone. When the present scheme was created, that view continued to be held, although within its first decade steps were made to disseminate knowledge of the system. Since that time and especially since the 1950s, the system has become a matter of interest to and use by a large number of libraries outside the Library of Congress. As a corollary, the Library has increased its efforts to make the scheme more readily available to the wider public. So much has this been the case, in fact, that during recent years the development of the scheme itself has been affected.

In sum, classification at the Library of Congress has changed from a strictly provincial practice to one that has approached universality in both its scope and use. In the process, the classification work of the Library has come to have a great deal of influence. One of its most enduring, though negative, effects has been its influence on classification thought. The idea of an enumerative approach to classification has become nearly synonymous with Library of Congress classification practice. But because the system has increasingly become unsystematic, the meaning of "enumerative" has also tended to become equated with the idea of lack of systematization. It is not appropriate to equate the two, however. The Library's system represents only one approach to enumeration, not its only possible expression. Another effect of the development of the present scheme has been to make shelf classification more efficient in the libraries that use the scheme. This has led to the widespread use of the scheme and to increasing interaction between its users and the Library of Congress as the source of the system. As the interaction grows, however, it cannot help having a significant effect on the system itself. An even greater effect would be that its growing complexity and the unavoidable expense of keeping up with it might well drive users to seriously question the nature and role of shelf classification in libraries in the first place. That result could do little harm and might well do great good.

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2. The general details of the history of the Library of Congress itself are taken from Cole, John Y., ed. *The Library of Congress in Perspective: A Volume Based on the Reports of the 1976 Librarian's Task Force and Advisory Group*. New York: R.R. Bowker, 1978; and Cole, John Y. "The Library of Congress in the Nineteenth Century." *Journal of Library History* 9(July 1974):222-40.

3. Cole, ed., *The Library of Congress in Perspective*, p. 6.

4. Cole, "The Library of Congress in the Nineteenth Century," p. 224.

5. D'Alembert, Jean LeRond. *Preliminary Discourse to the Encyclopedia of Diderot*, translated by Richard N. Schwab (Library of Liberal Arts). Indianapolis, Ind.: Bobbs-Merrill, 1963. La Montagne, *American Library Classification*, pp. 31-43 and *passim*, attributes the *Preliminary Discourse* wholly to D'Alembert, quoting several times from its text and listing the main elements of the classification chart found in that work. The difficulty with this is that D'Alembert actually wrote only the first two parts of the *Discourse*. The third part of the *Discourse* proper, the separate sections entitled "Detailed Explanation of the System of Human Knowledge" and "Observation on Bacon's Division of the Sciences," and the chart entitled "Detailed System of Human Knowledge" were originally written by Diderot for his *Prospectus* on the *Encyclopedie* and incorporated by D'Alembert into the *Discourse* with only minor editorial changes. Thus, the total presentation of the classification of knowledge basic to the *Discourse* with only minor editorial changes. Thus the total presentation of the classification of knowledge basic to the *Discourse* is the work of the two men together and should be labeled as such.

6. The standard comparison of Jefferson's classification with those of Bacon and, especially, Diderot/D'Alembert, at least for American readers, has been that of LaMontagne. That account needs to be revised, however, not only to take into account the mixed authorship of the Diderot/D'Alembert scheme mentioned in the previous note, but also to take into account more recent conclusions regarding the effect on Jefferson's thinking of 18th century Scottish philosophy. Something of Jefferson's debt to that philosophical school will be found in Wills, Gary. *Inventing America: Jefferson's Declaration of Independence*. Garden City, N.Y.: Doubleday, 1978. One likely effect of assessing this philosophical influence will be to show that much of what LaMontagne attributed to Jefferson's "practical" approach to classification was actually the result of Scottish ideas. Another would be to identify a convenient *terminus a quo* for Scottish philosophical influence on American subject access thinking, the *terminus ad quem* of which appears to have been the work of Charles A. Cutter. For a discussion of the latter, see Miksa, F. *The Subject in the Dictionary Catalog fr. n Cutter to the Present*. Chicago: ALA, 1983, pp. 24-157.

7. LaMontagne, *American Library Classification*, pp. 44-51.

8. Ibid., pp. 87-170 where LaMontagne describes many of these efforts. For the most part, however, they remained individual efforts confined to particular libraries.

9. During the 1850s the majority of libraries in the United States had fewer than 5000 volumes and most considerably less than that. The 10% that had larger collections reached a median size of 10,000 to 11,000 volumes. These figures are based on Jewett, Charles C. *Appendix to the Report of the Board of Regents of the Smithsonian Institution containing a Report on the Public Libraries of the United States of America, January 1, 1850*. Washington, D.C.: Printed for the Senate, 1850, pp. 190-91; Rhees, William J. *Manual of Public Libraries, Institutions, and Societies in the United States and British Provinces of North America*.

Philadelphia, Pa.: Lippincott, 1859; and "Library Reports and Statistics." In *Public Libraries in the United States of America, their History, Condition, and Management: Special Report, Part I.* Washington, D.C.: USGPO, 1876, pp. 745-856.

10. Miksa, *The Subject in the Dictionary Catalog*, pp. 102-05, he discusses the number of classificatory levels typically found in classed catalogs. Most catalogs did not go beyond two levels. The interplay between library environment and arrangement and fixed location book numbers has not been closely investigated but seems obvious. Natural lighting constraints made placing books in alcoves with windows centered in each a useful organizational device. That each alcove could then be considered a single class (or two, if each side was treated separately), was a natural correlation, not unlike placing the books of a relatively small home or office collection in discrete groups related to distinct cabinets or shelf sections. Alcove arrangements could be further subdivided, but to do so was risky. Shelf lists, written in the form of sheets and hung from hooks in the alcoves solved some of the problem of keeping track of things. But it was not until relative classification appeared that shelf arrangement was severed from such environmental matters.

11. Intrinsic relationships are those dependent on definition. For example, ZOOLOGY may be considered a legitimate subdivision of NATURAL HISTORY because the latter includes the former in its definition. A classification system dependent upon intrisic relationships is markedly different from modern classification thinking where a broad subject might be analyzed and subdivided according to any number of facets, many of which necessarily represent extrinsic relationships.

Extrinsic relationships are those dependent on factors other than definition. For example, agriculture might be divided intrinsically by a crop facet because the notion of crops is implied in the definition of agriculture. But it might also be divided by a political facet in which the relationship of agriculture to different systems of political thought are denoted. The relationship of agriculture to political thought is an extrinsic one, however. The latter is a subdivision of agriculture not by definition, but rather only in terms of an association superimposed on the two terms and based on some other abstract relationship.

12. Charles A. Cutter was one of the only nineteenth-century subject access workers to overcome the limitation. He did so by viewing subjects in terms of categories which themselves had classificatory relationships to one another. His approach to the matter is discussed by me in an earlier work. See Miksa, *The Subject in the Dictionary Catalog*, pp. 24-157.

13. One only need open most any classed catalog or index printed before the late 1860s to such topics as Medicine and Zoology to find numerous instances of the failure to subenter books under specific subjects. See, for example, entries under "Zoology" and "Useful arts and trades" in *Catalogue, Systematic and Analytical of the Books of the St. Louis Mercantile Library Association* St. Louis, 1858, pp.336-42, 379-85; those under "Natural History" and "Special Diseases" in the "Classified Index" of the *Catalogue of Books in the Mercantile Library of the City of New York* .New York: F.F. Taylor, 1866, pp. 609-04, 613-14; and those under "Zoology" and "Botany" in the *Catalogue of the Library of Congress, Printed by Order of Congress*. Washington, D.C.: Lemuel Towers, 1861, pp. 336-76. Interestingly, the opposite situation prevailed in the latter's section on the "Occupations of Man," pp. 382-440, where more specific subdivisions abound.

14. See Miksa, *The Subject of the Dictionary Catalog*, pp. 41-44, 158-77 for a fuller explanation of this difference in thinking. Another way to state this is that in this earlier period, subject access workers spoke of subjects simply being *in* books rather than being *of* books.

15. Ranz, Jim. *The Printed Book Catalogue in American Libraries: 1723-1900* (ACRL Monograph No. 26). Chicago: ALA, 1964, p. 43, summarizes the growth of library collections usefully, the author resting his observations mainly on the increase by 1875 in the number of libraries reporting collections of notable size—25,000 volumes or more. The increase was from a total of nine in Jewett's 1850 *Report on Public Libraries* to over 100 in the *1876 Special Report*.

16. Spofford, Ainsworth R. *Ainsworth Rand Spofford, Bookman and Librarian* (Heritage of Librarianship Series, no. 2), edited by John Y. Cole, p. 25. Littleton, Colo.: Libraries Unlimited, 1975.

17. *Catalogue of the Library of Congress, Index of Subjects*. Washington, D.C.: USGPO, 1869, 2 vols. The catalog did not always follow strict alphabetico-classed procedure insofar as some subordinate topics were arranged not alphabetically but by some other method. For example, Mathematics was subarranged in the following way:

1. General works
   - Dictionaries
   - Systematic
   - Misc. & Collections
   - Practical Mathematics
   - Philosophy, method & uses
   - History
2. Tables
   - General
   - Special subjects
   - (listed A-Z)
3. Instruments
   - Geometrical
   - Globes
   - Sliding Rule
4. Special subjects (listed A-Z)
5. Applications (listed A-Z)

(Sections 4 and 5 have occasional subsections alphabetically arranged)

18. A description of prominent alphabetico-classed catalogs is provided in Ranz, *The Printed Book Catalog*, pp. 70-72, 80-82. An analysis of their structure will be found in Miksa, *The Subject in the Dictionary Catalog*, pp. 113-21. The most notable included the Harvard College catalog on cards created by Ezra Abbot and Charles A. Cutter beginning in 1861, and those of the Brooklyn Library and the New York City Apprentices' Library, made respectively by Stephen B. Noyes and Jacob Schwartz.

19. A classificatory array consists of those topics that form a coordinate set. For example, the main headings of a systematic catalog constitutes one array, the set of subdivisions under each main heading constitute other separate arrays, the subsubdivisions under subdivisions still others, etc. In contrast, a classificatory chain consists of subjects related to one another hierarchically, from larger down to smaller in scope.

20. The classic description from the 19th century of how that option functioned is found in Abbot, Ezra. "Mr. Abbot's Statement Respecting the New Catalogues of the College Library." In *Report of the Committee of the Overseers of Harvard College Appointed to Visit the Library for the Year 1863*. Boston: Press of George C. Rand & Avery, 1864, pp. 55-59. He described in great detail the difficulties of placing the subject "tobacco" into the system.

21. In his 1869 *Catalogue of the Library of Congress, Index of Subjects*, Spofford regularly entered places directly for works on their history and travel, though he subordinated those same places for works on other topics such as law and political economy. This, in effect, gave direct entry for most of what ordinarily was gathered under history and geography in systematically-classed catalogs. He also occasionally broke up other classed sections by directly entering the subdivisions. See, for example, his list of references to the direct entries for subdivisions of Zoology, p. 1745.

22. The following description of Spofford's shelf classification work is taken from LaMontagne, *American Library Classification*, pp. 51-58; and Scott, "J.C.M. Hanson and His Contribution to Twentieth-Century Cataloging," pp.151-76.

23. Some idea of subdivisions used by previous librarians may be seen in the Library's 1861 *Catalogue of the Library of Congress, Printed by Order of Congress.*

24. LaMontagne, *American Library Classification*, p. 55.

25. "Condition of the Library of Congress," 54th Cong., 2d Sess., Senate, Report No. 1573. Washington, D.C.: USGPO, 1897, pp. 68-69, 78, 87. Spofford's class-by-class description of the scheme is found on pp. 67-87.

26. The main details of the events leading to the new classification and its initial development are taken from LaMontagne, *American Library Classification*, pp. 221-51; and Scott, "J.C.M. Hanson and His Contribution to Twentieth-Century Cataloging," pp. 151-227.

27. Accounts of classification trends beginning with Dewey's work have typically focused on what schemes were devised and who their creators were. They have also taken great pains to describe the formal aspects of their structure, particularly the makeup of their main classes. See LaMontagne, *American Library Classification*, pp. 73-218; and Eaton, Thelma.

"The Development of Classification in America."In *The Role of Classification in the Modern American Library* (Papers Presented at an Institute Conducted by the University of Illinois Graduate School of Library Science, November 1-4, 1959). Champaign-Urbana: University of Illinois, 1959, pp. 8-30. These provide more recent examples of this approach. In contrast, what is stressed here is how library classifiers grappled with some of the more fundamental ideas basic to their task, particularly the problem of subject specification and how they viewed the universe of subjects.

28. A brief discussion of Cutter's classification ideas and selections from his classification writings will be found in Cutter, Charles A. *Charles Ammi Cutter: Library Systematizer* (Heritage of Librarianship Series No. 3), edited by Francis Miksa, pp.57-61, 238-88. Littleton, Colo.: Libraries Unlimited, 1977. That Cutter viewed classification as the starting point for all subject access, including the dictionary catalog, is discussed in Miksa, *The Subject in the Dictionary Catalog*, pp. 24-123.

29. A more extensive discussion of the development of this idea will be found in Miksa, *The Subject in the Dictionary Catalog*, pp. 45-71.

30. Quoted in LaMontagne, *American Library Classification*, p. 224.

31. Martel, Charles. "Library of Congress Classification." *Bulletin of the American Library Association* 5 (July 1911):231; and Chan, *Immroth's Guide to the Library of Congress Classification*, pp. 47-54.

32. Scott, "J.C.M. Hanson and His Contribution to Twentieth-Century Cataloging," pp. 201-02.

33. Ibid., pp. 206-12 where Scott discusses at length the report and the Montreal Conference interviews.

34. Ibid., pp. 217-21.

35. Putnam, Herbert. "The Library of Congress as a National Library." *Library Journal* 30 (Sept. 1905):33.

36. The chronological periods used in the remainder of the paper have been established on the basis of notable publishing events in relation to the scheme: the especially large number of schedules published during 1910-11; the appearance of the scheme's additions and changes bulletin in 1928 correlated with the cessation of revised schedules; and systematic efforts to publish changes and revised schedules from 1947 onward. As is usually the case in setting chronological periods, reasons might be successfully advanced to question such inclusive dates, particularly when the content of the various periods overlap. As a first attempt to provide a framework for referring to the development of the scheme, however, the periods used here have seemed appropriate despite occasional and slight overlapping. Other significant events in the life of the Library will be referred to within this chronological breakdown.

37. Scott, "J.C.M. Hanson and His Contribution to Twentieth-Century Cataloging," pp.225-26; and *Annual Report of the Librarian of Congress for the Fiscal Year Ending June 30, 1902*. Washington, D.C.: USGPO, 1902, p. 86. The annual reports of the Librarian of Congress, the single best published source for information on the Library, its staff, and classification work and developments, will hereafter be cited as *Report of the Librarian* followed by the year and page numbers. The reports officially chronicle activities that ended with the fiscal year on June 30. Because they were ordinarily written and published by the following December of the year in question, they often included information on developments that took place between June 30 and the publication date.

38. See especially *Report of the Librarian* (1902), pp.12-13; and (1904), p. 13. The role of Koenig is elaborated ahead in the discussion of the period from 1912-30.

39. *Report of the Librarian* (1910), p. 7; and (1912), p. 12. J.C.M. Hanson later reminisced about the development of the scheme after 1815 in "The Library of Congress and its New Catalogue." In *Essays Offered to Herbert Putnam, by his Colleagues and Friends on his Thirtieth Anniversary as Librarian of Congress*, reprint ed., edited by W.W. Bishop and A. Keogh, p. 187. Freeport, N.Y.: Books for Libraries Press, 1967. Hanson said that Martel was "one who for the next nineteen or twenty years carried on the chief burden of this exceptionally difficult and important work." That would bring the most important period of Martel's influence on the scheme to 1916 or 1917.

40. For a more extensive discussion of a specialists' orientation in the work of J.C.M. Hanson, see Miksa, *The Subject in the Dictionary Catalog*, pp. 204-11, 398-400. A thorough and exemplary discussion of the rise of scholarly specialization in America will be found in Oleson, Alexandra, and Voss, John, eds. *The Organization of Knowledge in Modern America, 1860-1920*. Baltimore, Md.: Johns Hopkins University Press, 1979. See especially chapters by John Higham, Edward Shils, and John Y. Cole.

41. The following discussion of common arrangement patterns is based on my study currently in progress on "Martel's Seven Points and LCC Internal Structure" in which more than 500 subject classes of varying sizes found throughout the system are being compared with the frequency of patterns statistically recorded. Charles Martel labeled the seven-point pattern as such and commented on it briefly in his "Library of Congress Classification," p. 231. Thereafter, it seems to have dropped from sight, even in later writings of Martel. That may be because after 1911 when Martel spoke of the scheme, the pattern was not being followed as rigorously. LaMontagne, *American Library Classification*, pp. 255-75, later discussed the pattern at some length, but without viewing the points as "clusters." The discussion of the points in Chan, *Immroth's Guide to the Library of Congress Classification*, pp. 47-56 may well go back to LaMontagne for its point of departure. But there too the nature of the points as "clusters" and their role in the development of the schedules is not discussed.

42. The most common explanation of "aspect" subdivisions is that they represent the coordination of a topic from another subject field with the field at hand. Books on the History of Chemistry signify this kind of relationship and are regularly classified under the —HISTORY aspect subdivision of Chemistry rather than being placed in the History subject area. It is usually noted that aspect divisions of this kind, including —HISTORY, —PHILOSOPHY, and —STUDY AND TEACHING, are materially different from other subdivisions of a topic like Chemistry such as Qualitative or Quantitative chemistry. The latter function as kinds or parts of Chemistry and require placement under Chemistry. The placement of books representing aspect subdivisions, discussed ahead under "Progress on the Classification: 1901-1911," often seem clear in the kinds of cases mentioned here. But that may be because they have become accepted in practice rather than because they have been justified from any analytical approach to the problem.

43. *Report of the Librarian* (1911), p. 61.

44. Ibid.

45. Ibid., p. 62.

46. Ibid., pp. 62-63.

47. *Report of the Librarian* (1916), pp. 103-04.

48. Ibid., (1911), pp. 61-62.

49. Martel, "Library of Congress Classification," p. 232.

50. Totals for reclassification are given as estimates because of the sketchy nature of published figures for reclassification before 1903. For 1898 and 1899, some figures are available from general descriptions of the work. From 1900 to 1902, overall totals were given for items placed either in the old or the new classification systems. But the figures for the new system are not further broken down between reclassified items and new accessions. Only with the 1903 annual report is the latter division made. In addition, for the period 1903 to 1905, and from 1913 onward, a breakdown of reclassification figures by schedule areas is also included in the reports.

51. Law (schedule K) was mentioned regularly until 1911 among backlog to be finished as if it too were scheduled for reclassification. Beginning in 1912, however, it dropped out of the discussion and, thereafter, only Literature and Religion materials were regularly discussed as backlog yet to be done.

52. *Report of the Librarian* (1912), p. 89.

53. See especially, *Report of the Librarian* (1918), p. 75; (1919), p. 76; (1921), p. 77; (1924), pp. 129-30; and Perley, Clarence W. "Recent Developments in L.C. Classification." In *Proceedings of the Catalog Section, American Library Association*, p. 64. Chicago: Catalog Section, ALA, 1929.

54. *Report of the Librarian* (1921), p. 78.

55. Perley, "Recent Developments in L.C. Classification," p. 64.

56. For a discussion of the change in emphasis of the Library's programs, see Cole, ed., *The Library of Congress in Perspective*, pp. 21-25. For a chronological listing of various programs, etc., see entries for the years 1911-30 in Cole, John Y. *For Congress and the Nation, a Chronological History of the Library of Congress*. Washington, D.C.: Library of Congress, 1979, pp. 82-97.

57. *Report of the Librarian* (1911), p. 61.

58. See Cutter, Charles A. "Place of Folk-lore in Classification—A Problem." *Library Journal* 9(Aug. 1884):136. Charles A. Cutter had summarized the noted difficulty of classifying this kind of material more than two decades previously.

59. *Report of the Librarian* (1909), p. 51; (1910), pp. 64-65; (1911), pp. 59-60; and (1912), pp. 89-90.

60. *Report of the Librarian* (1913), p. 96; (1914), p. 108; and (1915), p. 110.

61. *Report of the Librarian* (1910), p. 296. As will be noted ahead, Koenig's enormous influence over languages and literature reclassification and schedule production was such that he and not Clarence W. Perley, the division chief, appears to have set the tone and rhythm for the work. In the end, his work was greatly appreciated for its scholarliness. But it also seems to have been overly pedantic, at least from the standpoint that the Library needed to expedite the work. As a result, work on those schedules progressed at a very slow rate. That there was some sort of conflict between Koenig's careful but slow approach to the task and the Library's need for expediency may well be reflected on page iii of the introduction to the PB-PH schedule (1933) where Perley wrote the otherwise meaningless statement that the schedules were now "definitely taken in charge by the present staff of the classification division."

62. The original order of the classes is found in "Synopsis I" in the introduction to the P-PA schedule (1928). The intention to proceed systematically through the schedules is reflected in (1) the regular apologies given throughout the decade from 1910 onward for not completing classical philology (PA), and (2) notes during 1911 and 1912 that gave expediency as the reason for doing large and much used literatures first—i.e., out of systematic order. That a single schedule text for P was the goal is inferred in the constant references to P as a single unit. Even when PN, PR, PS, PZ were published separately in 1915, the remainder seems to have been considered a single unit, at least for publishing purposes.

63. *Report of the Librarian* (1911), p. 59; (1912), p. 89; and PB-PH (1933), intro., p. iii. It is noted that a scheme for Russian literature was only then being devised; PJ-PM (1935), p. iii, where Perley notes that he had added schemes for African languages and Arabic literature in order to prepare the schedule for publication.

64. Perley made a brief apology for departures from the tables in PB-PH (1933), intro., p. iii.

65. PN, PR, PS, PZ (1915), intro., p. 3.

66. Martel's authorship of this device has been accepted by tradition and ordinarily dated at about 1911. There is no published confirmation of this fact, however. Scott, "J.C.M. Hanson and His Contribution to Twentieth-Century Cataloging," p. 226, pins the device down only to the first decade and notes that whereas Hanson thought the device to be confusing, Martel thought not.

67. *Report of the Librarian* (1911), p. 59; (1912), p. 89; and (1913), p. 96.

68. PT, part II (1942), intro., p. iii; and *Report of the Librarian* (1916), p. 100. The help of Jules Dieserud of the Catalog Division is acknowledged in the preparation of a scheme for Scandinavian literature during 1915-16. Other outside help is also occasionally noted in the annual reports and schedule introductions. The saga of the classical literature area and its delays is recorded in a series of notes in the annual reports beginning in 1911 and continuing to 1919.

69. *Report of the Librarian* (1914), p. 108.

70. *Report of the Librarian* (1920), p. 89; (1921), p. 76; (1922), p. 98; (1923), p. 101; (1925), pp. 125-26; (1926), p. 161; (1927), p. 150; (1928), p. 176; Perley, "Recent Developments in L.C. Classification," p. 64; and Hanson, "The Library of Congress and its New Catalogue," p. 192.

71. An example of the problem of changing categories is noted in R, 2d ed. (1921), p. 3.

72. *Report of the Librarian* (1916), pp. 104-05; and (1928), pp. 177-79.

73. *Report of the Librarian* (1926), pp. 162-63; and (1928), p. 176. At some point during the next decade, the form of the publication of additions and changes became that of a single printed list.

74. *Report of the Librarian* (1930), p. 269; Pierson, Harriet W. "Charles Martel." *Catalogers' and Classifiers' Yearbook* 9(1940):11-13.

75. Cole, ed., *The Library of Congress in Perspective*, p. 25; and Cole, *For Congress and the Nation*, pp. 88-104.

76. This picture of administrative ills of the Library is extracted mainly from the manuscript, Rice, Paul N., et al. "Report of the Librarian's Committee to the Librarian of Congress on the Processing Operations in the Library of Congress." Washington, D.C.: LC, 1940, especially pp. 1-127. A brief summary of the situation may be found in Cole, ed., *The Library of Congress in Perspective*, pp. 23-24.

77. Cf. Rice, et al., "Report of the Librarian's Committee," pp. 68-69.

78. Conditions in the Classification Division are not only recorded in the "Report of the Librarian's Committee," pp. 49-60, but may be gleaned from the yearly statements in the *Report of the Librarian* (1930-39).

79. The correlation of a new T schedule with the creation of the Aeronautical Division is found in *Report of the Librarian* (1937), p. 240.

80. The best overall account of the reorganization of the Library is found in MacLeish, Archibald. "The Reorganization of the Library of Congress, 1939-44." *Library Quarterly* 14(Oct. 1944):277-315. For an account restricted to the Library's processing operations, see Mumford, L. Quincy. "Account of the Reorganization of the Processing Department at the Library of Congress." *Catalogers' and Classifiers' Yearbook* 10(1941):45-56.

81. *Report of the Librarian* (1942), pp. 20-21; (1943), pp. 43-46, 142-43. For a more general account of Haykin's work, especially on subject headings and cooperative subject access, see Mikaa, *The Subject in the Dictionary Catalog*, pp. 334-40.

82. *Report of the Librarian* (1942), p. 142.

83. *Report of the Librarian* (1941), p. 209.

84. *Report of the Librarian* (1943), pp. 43-46, 230; (1944), p. 79; and (1945), pp. 43-44, 76-77.

85. Cole, ed., *The Library of Congress in Perspective*, pp. 32-40.

86. Class P, Subclass PG (in part) (1948), p. iii; *Report of the Librarian* (1942), p. 142; and (1948), p. 91.

87. The account of the development of the law schedule summarized here and later is taken from Evans, Martha M. "A History of the Development of Classification K (Law) at the Library of Congress." In *Reader in Law Librarianship* (Readers in Librarianship and Information Science No. 22), edited by B.D. Reams, Jr., pp. 193-207; Angell, Richard S. "Development of Class K at the Library of Congress." *Law Library Journal* 57(Nov. 1964):353-60; and *Report of the Librarian* (1949-69).

88. Evans, "A History of the Development of Classification K (Law)," p. 199.

89. Dewton, J.L. "Subject Index According to the Library of Congress Classification." *Library of Congress Information Bulletin* 8(27 Dec. 1949-2 Jan. 1950):12-13.

90. *Report of the Librarian* (1944), p. 79; (1948), p. 92; and (1950), p. 122.

91. *Report of the Librarian* (1949), p. 125; and (1942), p. 142.

92. Figures were reported beginning in the 1944 *Report of the Librarian*. Haykin supplied no comparative figures for the 1930s as he had done for subject headings. But the total could not have been great if Perley's statement that there was little time to improve the system "except as new subdivisions were actually forced on us" was as true for that decade as for before. See Perley, "Recent Development in L.C. Classification," p. 64.

93. *Report of the Librarian* (1952), p. 71. See also *Report of the Librarian* (1948), p. 92; and (1949), pp. 124-25.

94. *Report of the Librarian* (1950), p. 122.

95. *Report of the Librarian* (1951), p. 78.

96. *Report of the Librarian* (1955), p. 19; (1958), p. 17; (1961), pp. 9-10; (1962), p. 14; (1963), p. 13; and (1966), p. 44.

97. *Report of the Librarian* (1940), p. 274; Angell, Richard S. "On the Future of the Library of Congress Classification." In *Proceedings of the Second International Study Conference, Elsinore, Denmark, 14th to 18th September, 1964*, p. 102; and Mowery, Robert L. "The 'Trend to LC' in College and University Libraries." *Library Resources & Technical Services* 19(Fall 1975):394-95. The 1980s figure is from a personal communication in 1982 from Mary Kay Pietras, chief of the Subject Cataloging Division. *Report of the Librarian* (1967), p. 48 suggested that two primary reasons for libraries to adopt the scheme were the MARC project and the National Program for Acquisitions and Cataloging (NPAC). In short, the Library's scheme and the availability of LC numbers on catalog copy were simply more economical.

98. Tauber, Maurice F. "Review of the Use of the Library of Congress Classification." In *The Use of the Library of Congress Classification*, edited by R.H. Schimmelpfeng and C. Donald Cook, pp. 1-3. Chicago: ALA, 1968.

99. Matthis, Raimund E., and Taylor, Desmond. *Adopting the Library of Congress Classification System: A Manual of Methods and Techniques for Application or Conversion*. New York: R.R. Bowker, 1971, p. 5.

100. As recorded in the annual reports of the Library and especially *Report of the Librarian* (1967), p. 138, DDC numbers, which had averaged in the low 20,000s for this entire period, increased dramatically beginning in 1967 to more than twice that total.

101. Library of Congress. Subject Cataloging Division. *Library of Congress Classification Schedules: A Cumulation of Additions and Changes....* Detroit, Mich.: Gale Research Co., 1971- .

102. *Report of the Librarian* (1970), p. 22.

103. Evans, "A History of the Development of Classification K."

104. Olson, Nancy B., comp. *Combined Indexes to the Library of Congress Classification*. Washington, D.C.: U.S. Historical Documents Institute, 1974; and Library of Congress. Subject Cataloging Division. *Shelflist of the Library of Congress* (microform). Ann Arbor, Mich.: University Microfilms International, pp. 1978-80. The latter has been updated periodically.

105. Library of Congress. Subject Cataloging Division. *Classification: Class N, Fine Arts*, 4th ed. Washington, D.C.: 1970, p. iii; and *LC Classification, Additions and Changes* (list 168, Oct.-Dec. 1972), Appendix, p. i.

106. The papers were published in Schimmelpfeng, Richard H., and Cook, C. Donald, eds. *The Use of the Library of Congress Classification*. Chicago: ALA, 1966.

107. In the summer of 1974, the Library of Congress not only revised the format and regularized the frequency of the *Bulletin* issued by its Cataloging Service, but began regularly to include a wider range of policy information in it. For example, its previously internal *Shelflisting Bulletin* ceased at about the same time, the policy information in that publication thereafter published in the *Cataloging Service Bulletin*.

108. *Report of the Librarian* (1969), p. 22.

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